Title: String Theory Review-15

Date: Feb 13, 2015 10:15 AM

URL: http://pirsa.org/15020025

Abstract:

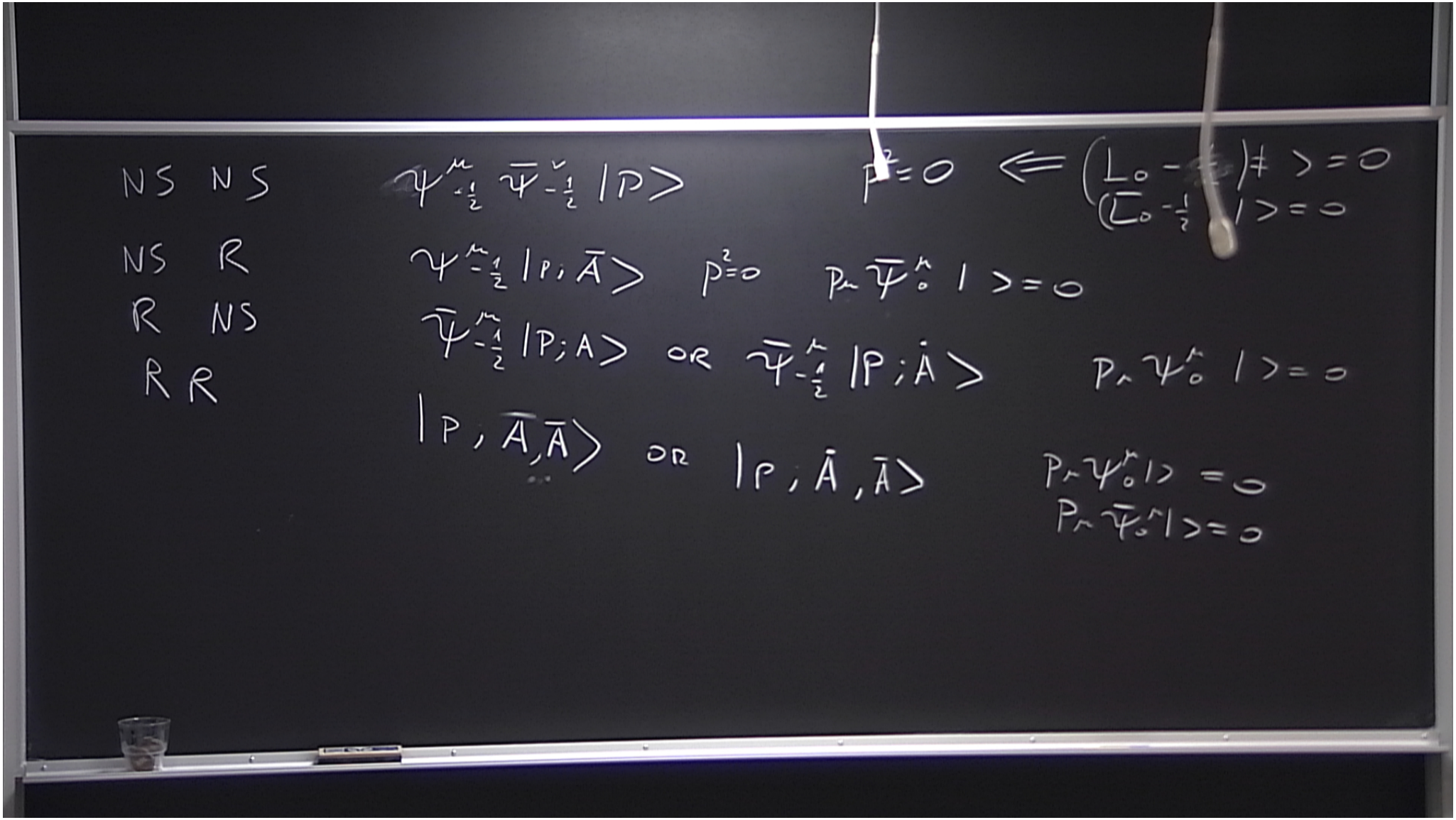
$\not{\partial} \; = 0$

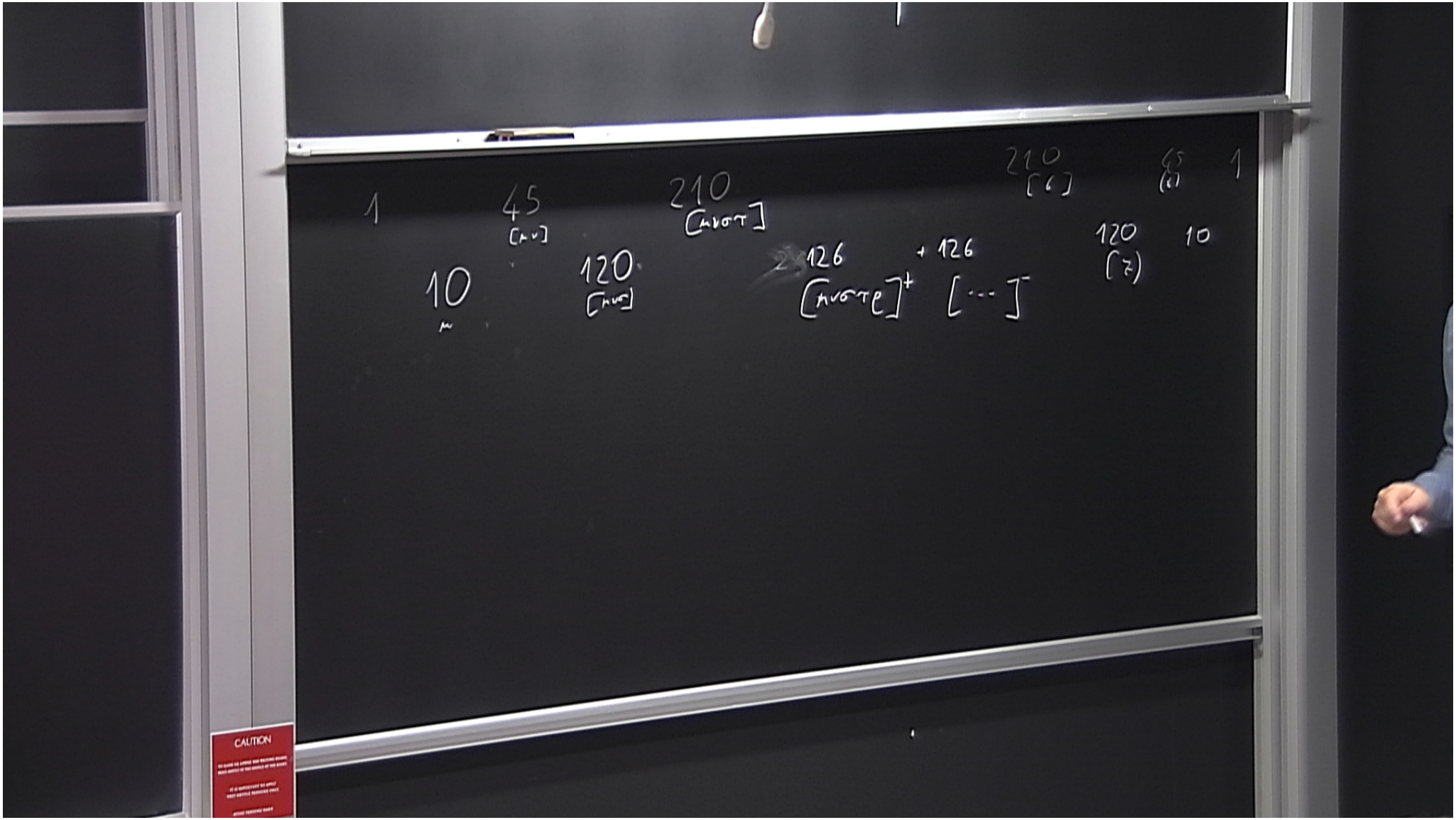
NS NS $\quad \psi^{\mu}_{-\frac{1}{2}} \bar{\psi}^{\nu}_{-\frac{1}{2}} |p\rangle \qquad p^2 = 0 \Leftarrow \left(L_0 - \frac{1}{2}\right)|\;\rangle = 0$
$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad \left(\bar{L}_0 - \frac{1}{2}\right)|\;\rangle = 0$

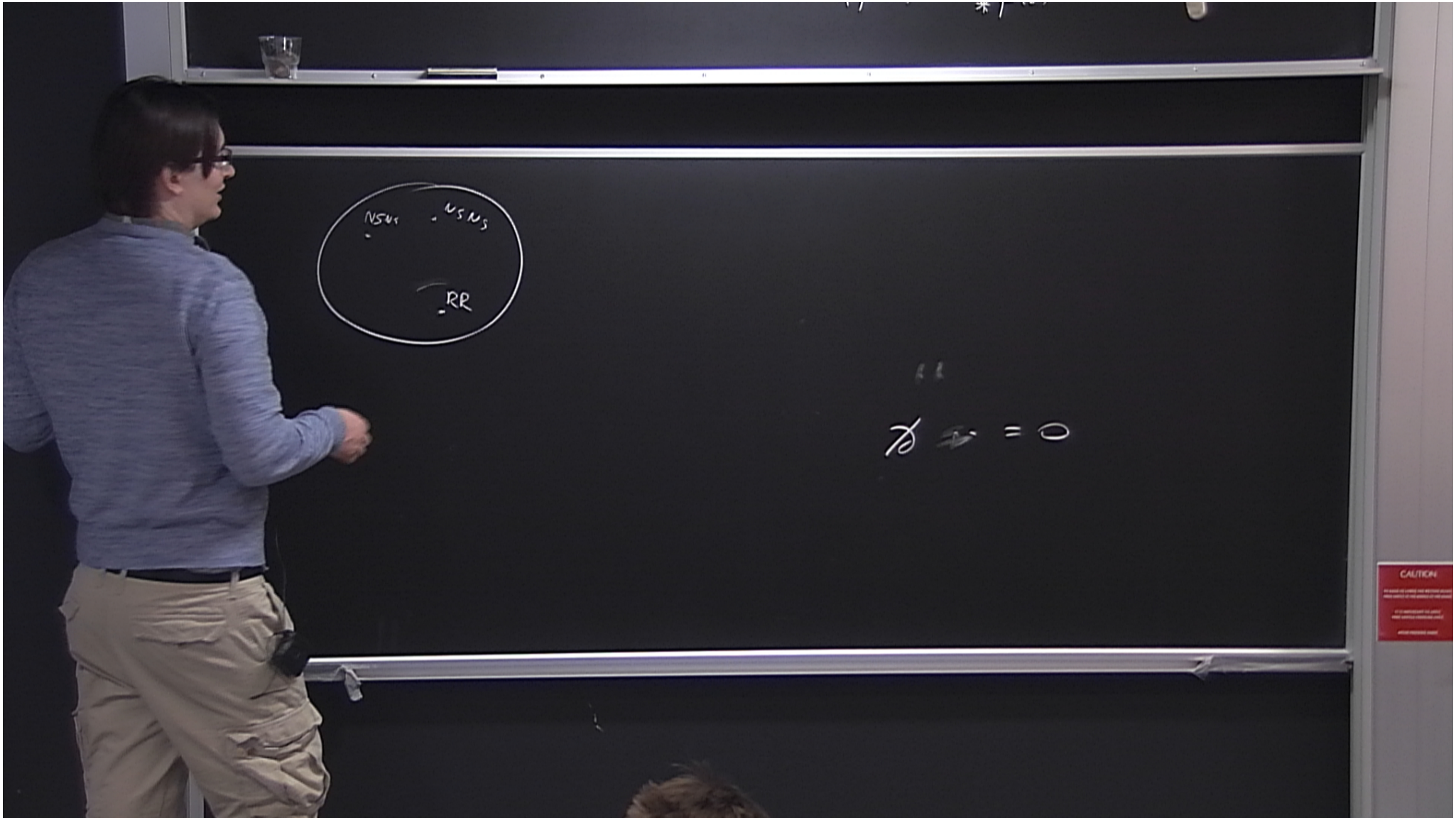
NS R $\quad \psi^{\mu}_{-\frac{1}{2}} |p; \bar{A}\rangle \qquad p^2 = 0 \qquad p_\mu \bar{\psi}^{\mu}_{0} |\;\rangle = 0$

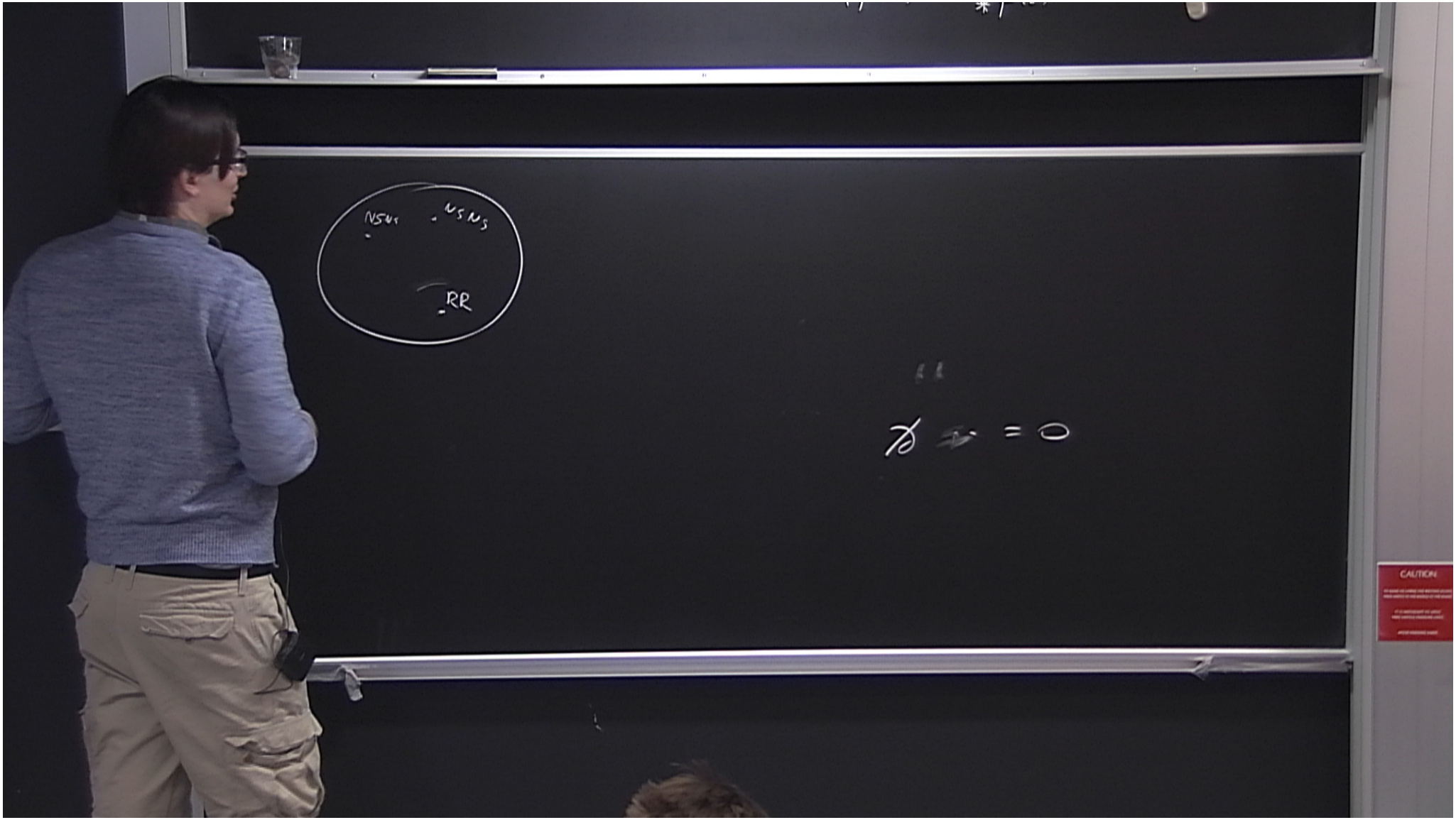
R NS $\quad \bar{\psi}^{\mu}_{-\frac{1}{2}} |p; A\rangle$ OR $\bar{\psi}^{\mu}_{-\frac{1}{2}} |p; \dot{A}\rangle$

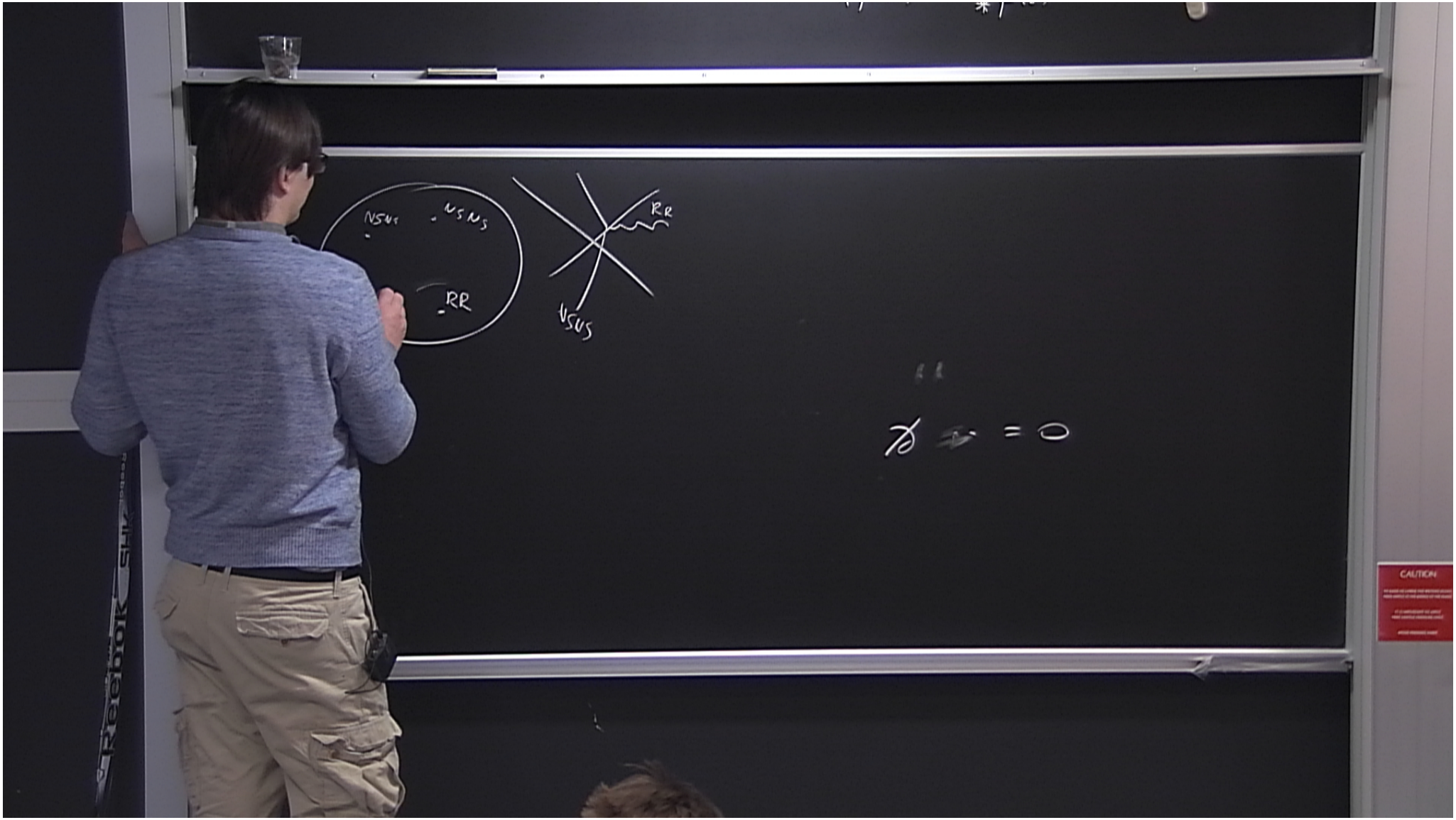
R R $\quad |p, \bar{A}, \bar{A}\rangle$ OR $|p, \dot{A}, \bar{A}\rangle$

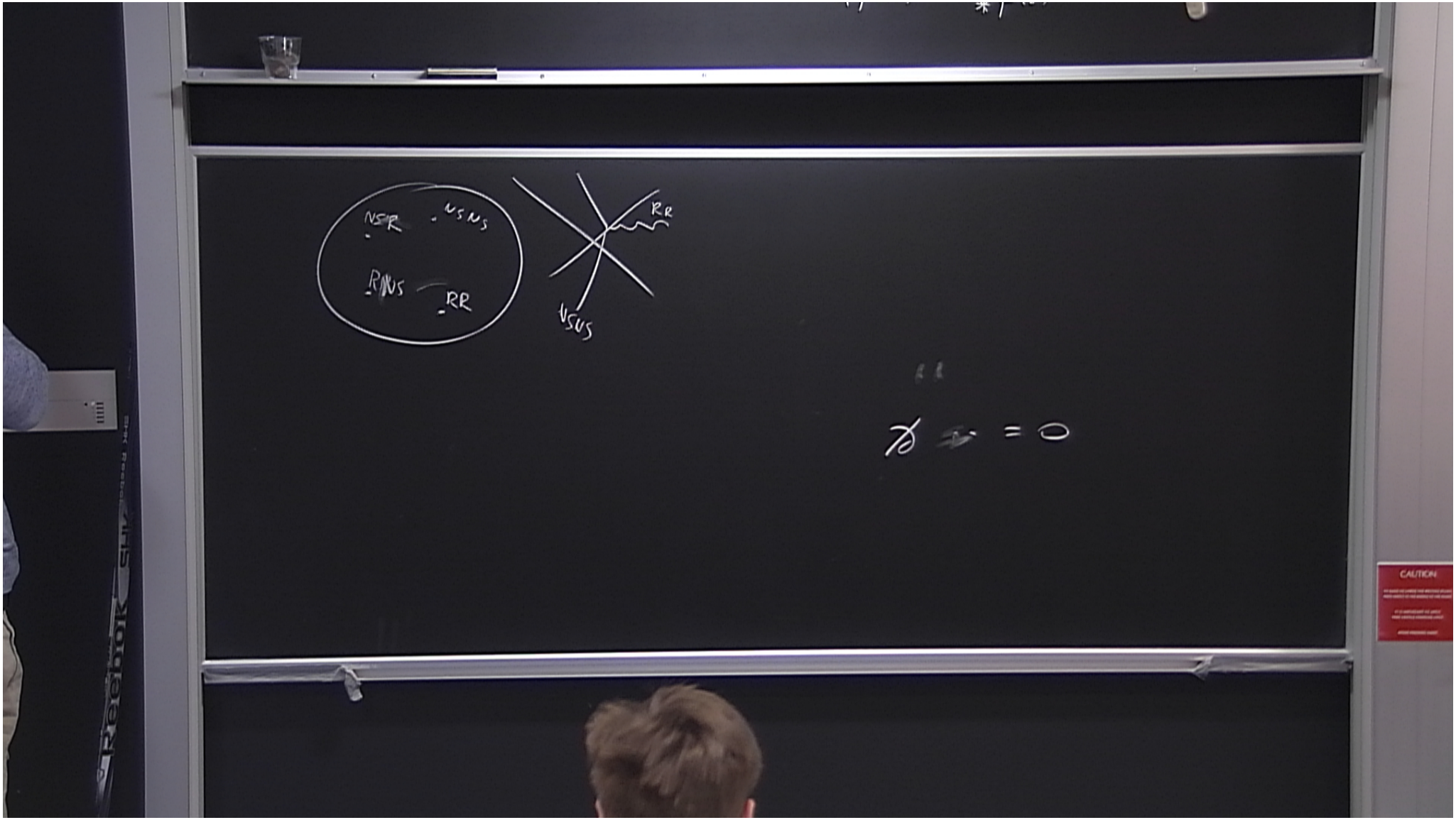

NS NS
NS R
R NS
R R
$\psi^{\mu}_{-\frac{1}{2}} \bar{\psi}^{\nu}_{-\frac{1}{2}} |p\rangle$
$p^2 = 0$
$\psi^{\mu}_{-\frac{1}{2}} |p; \bar{A}\rangle$
$p^2 = 0$
$p_\mu \bar{\psi}^{\mu}_{0} |\rangle = 0$
$\bar{\psi}^{\mu}_{-\frac{1}{2}} |p; A\rangle$ OR $\bar{\psi}^{\mu}_{-\frac{1}{2}} |p; \dot{A}\rangle$
$p_\mu \psi^{\mu}_{0} |\rangle = 0$
$|p, A, \bar{A}\rangle$ OR $|p, \dot{A}, \bar{A}\rangle$
$p_\mu \psi^{\mu}_{0} |\rangle = 0$
$p_\mu \bar{\psi}^{\mu}_{0} |\rangle = 0$

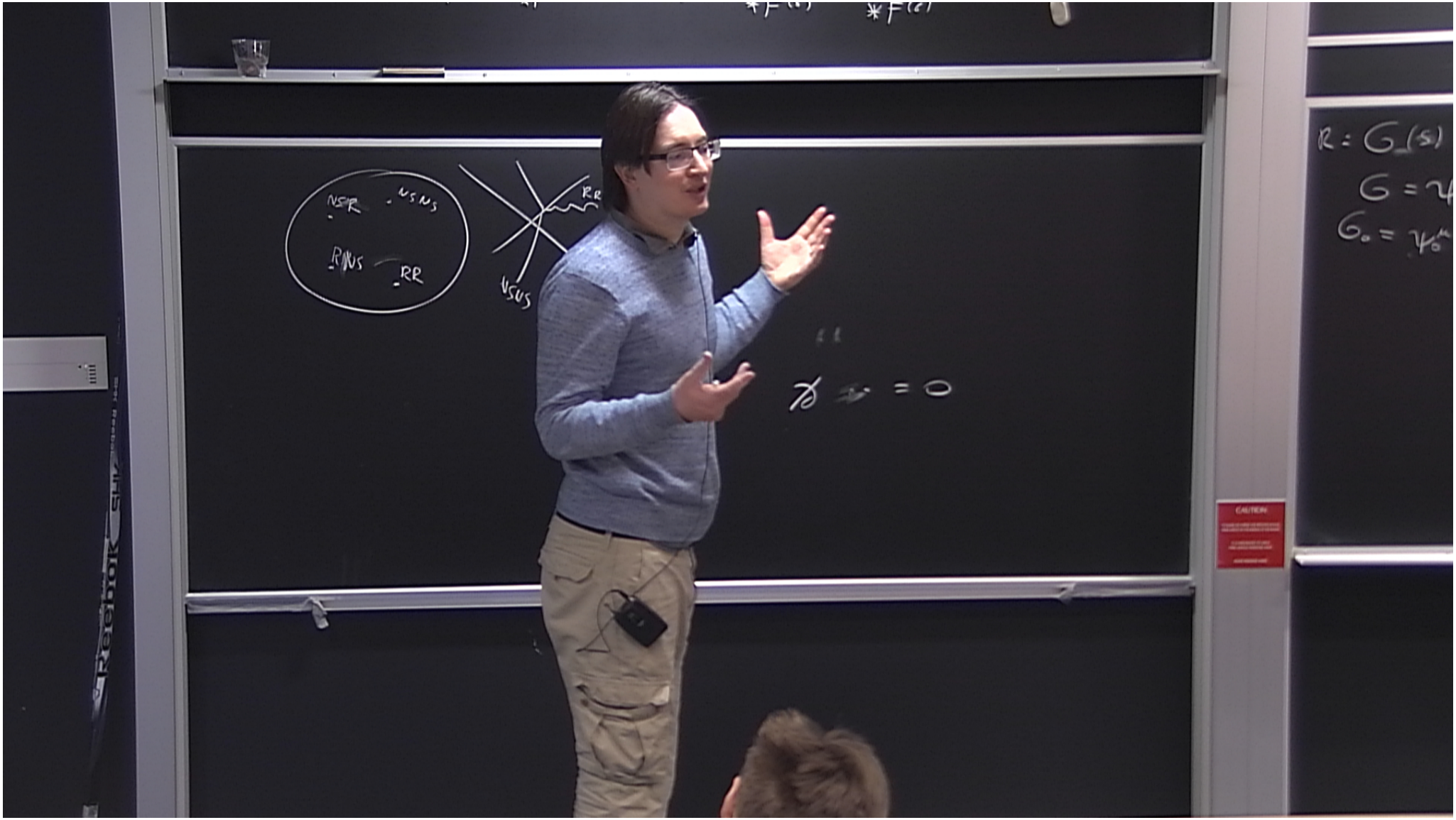

1
45
[AV]
210
[AVOT]
210
[G]
1
10
120
[AVG]
126
[AVOTE]+
+ 126
[...]
120
[Z]
10
CAUTION

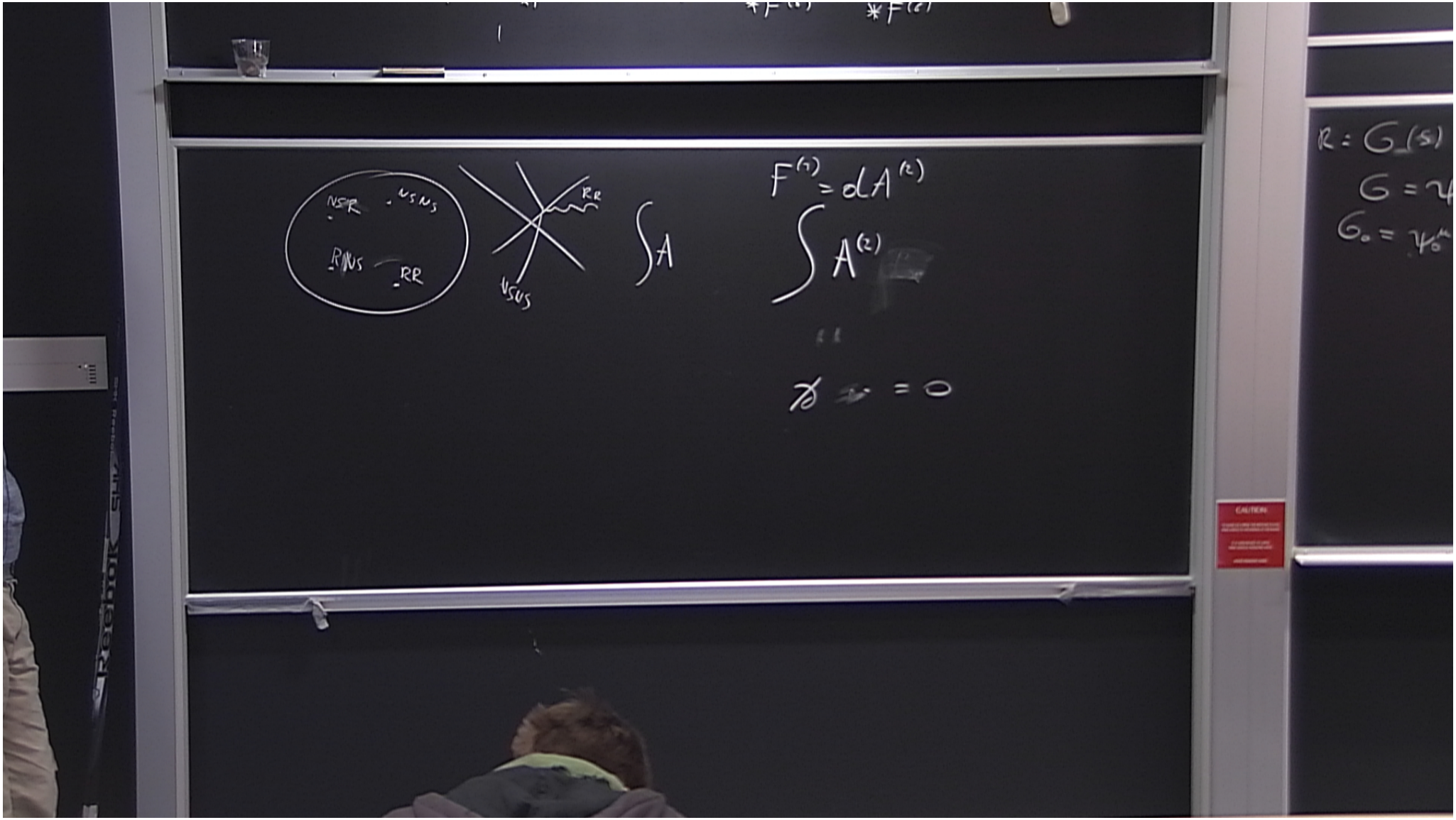

NSNS
USNS
RR
= 0
CAUTION

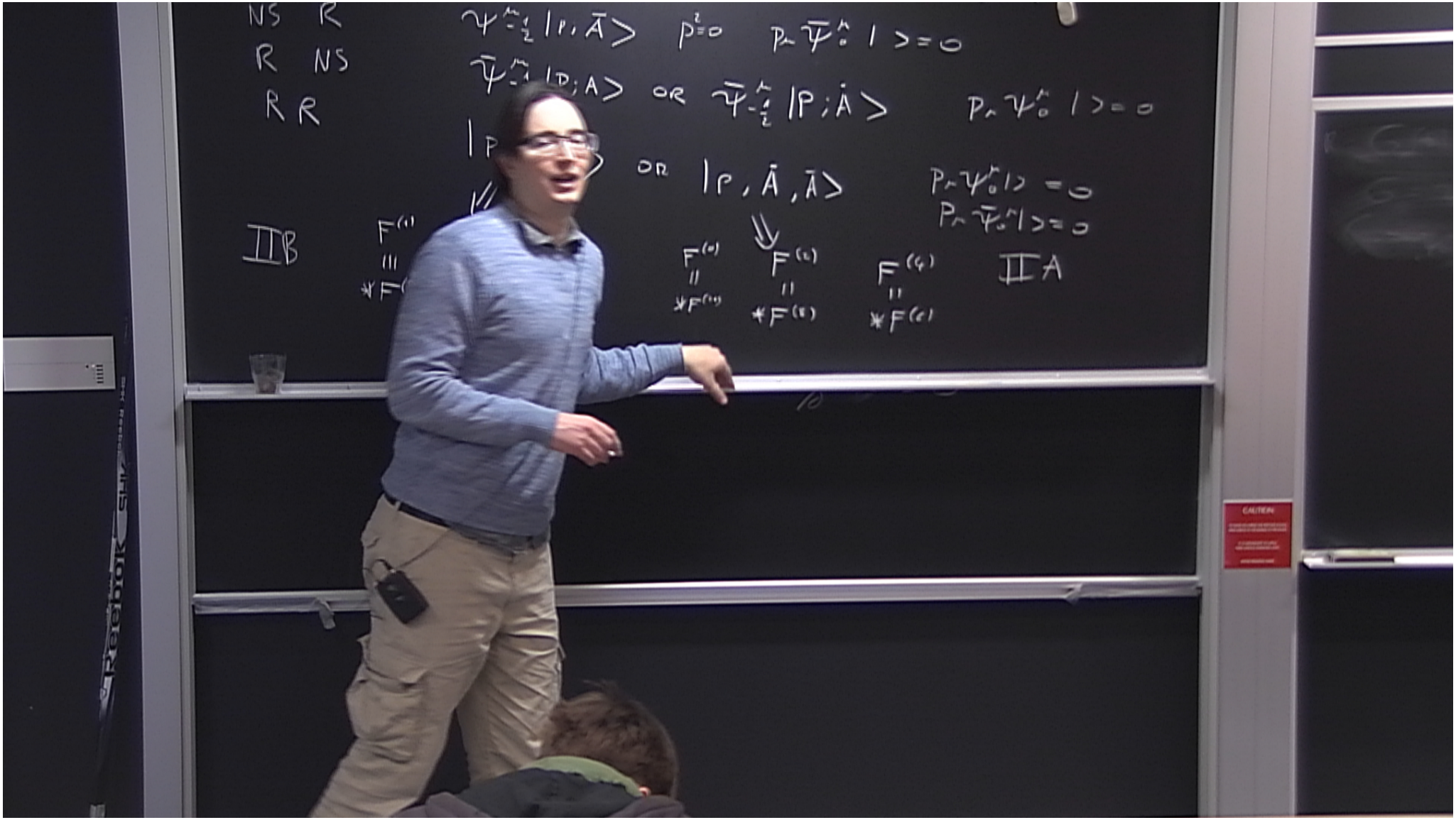

NSNS
USNS
RR
CAUTION

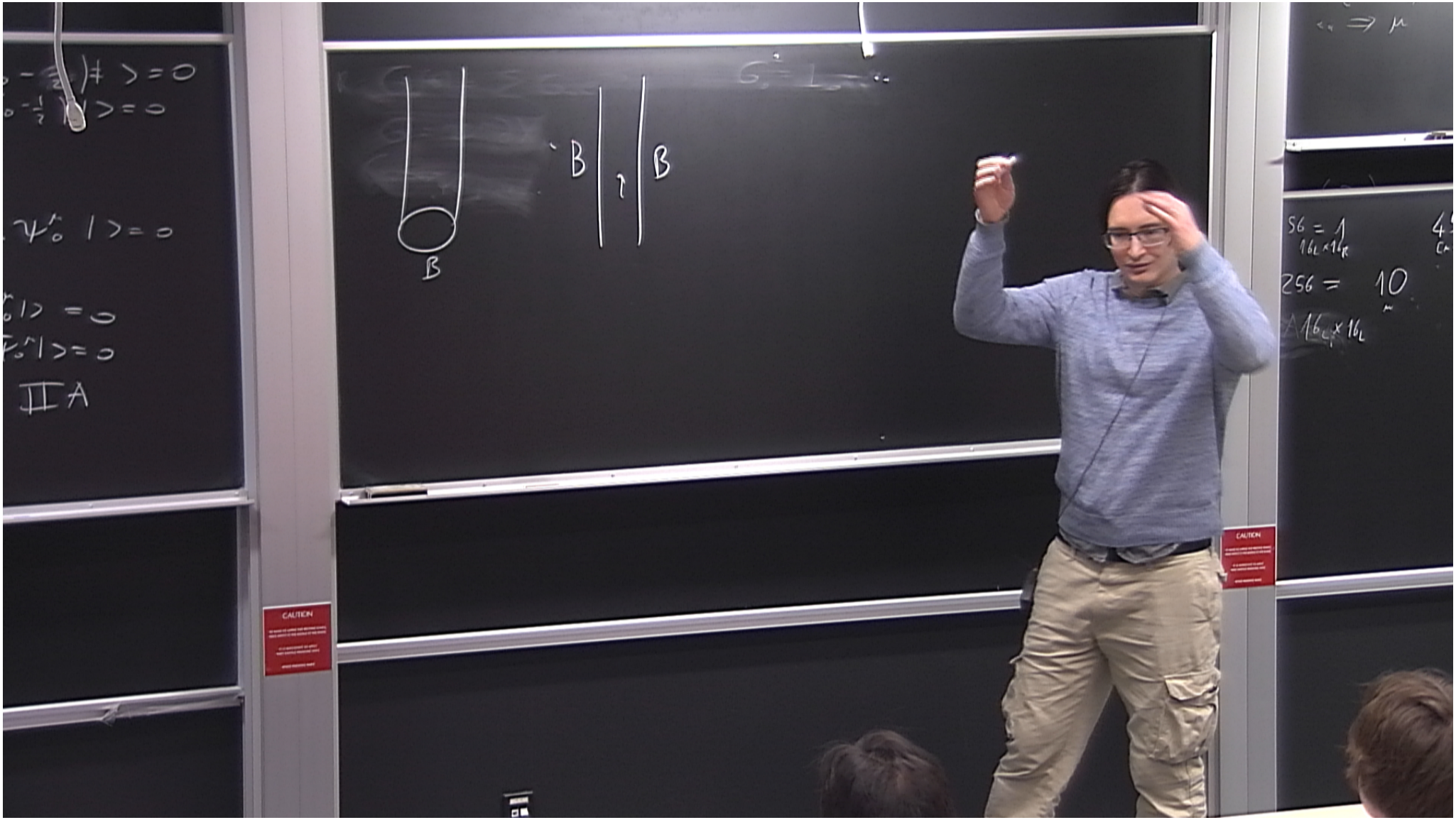

NSNS
VSNS
RR
RR
VSUS
CAUTION

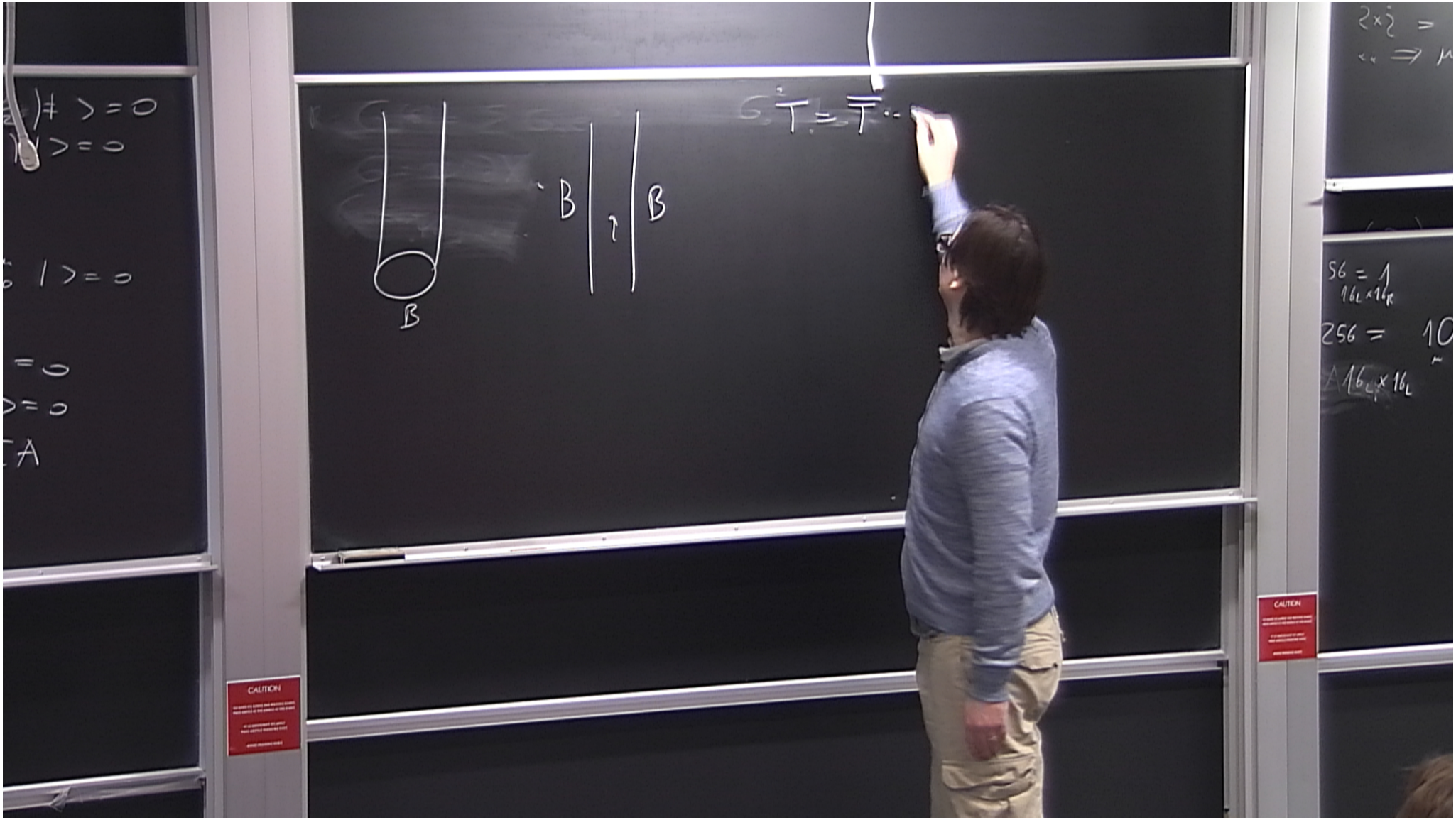

NSR
USUS
RNS
RR
RR
USUS
CAUTION

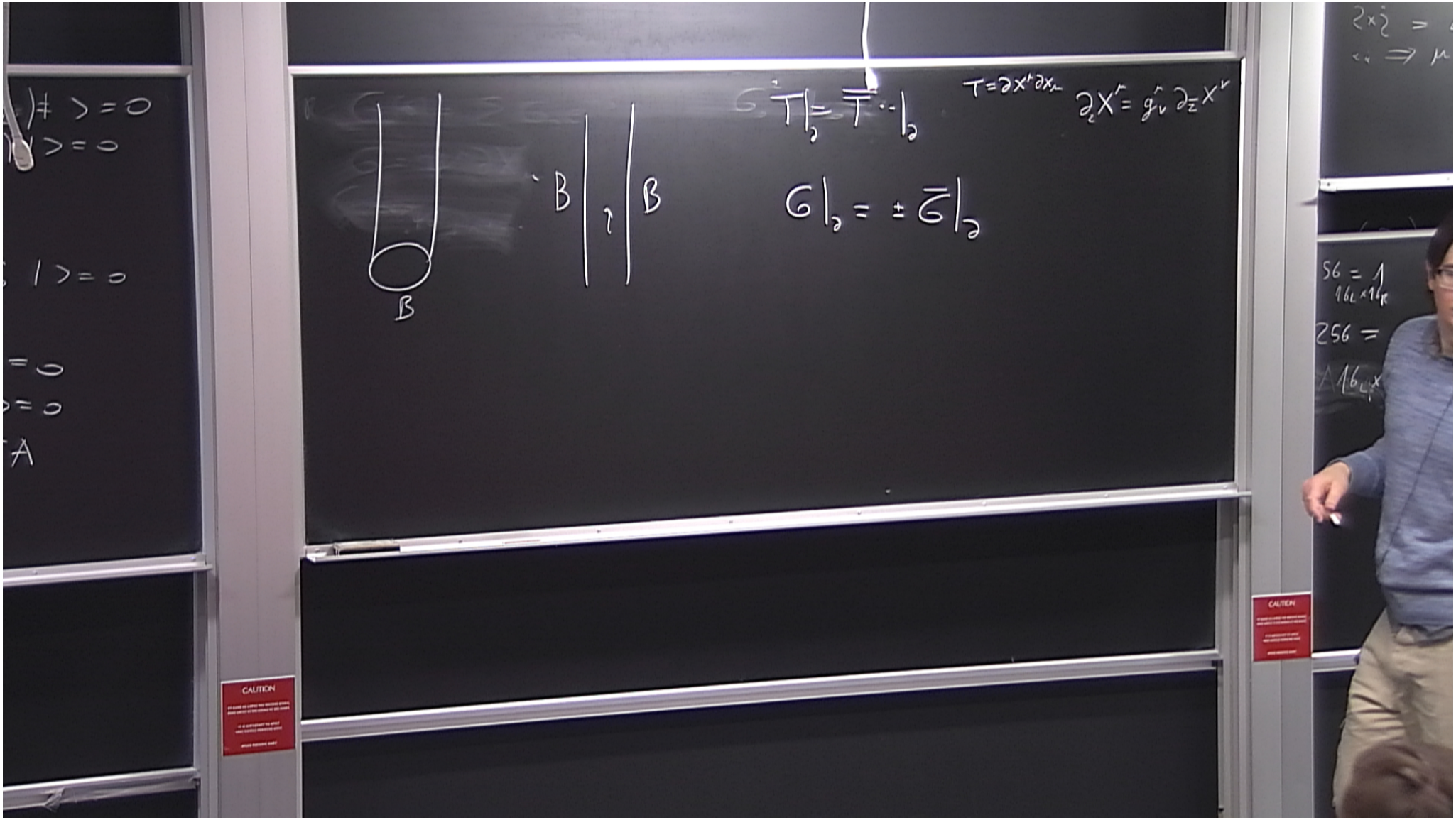

NSR
NSNS
RNS
RR
RR
NSNS
R = G(s)
G =
G₀ =

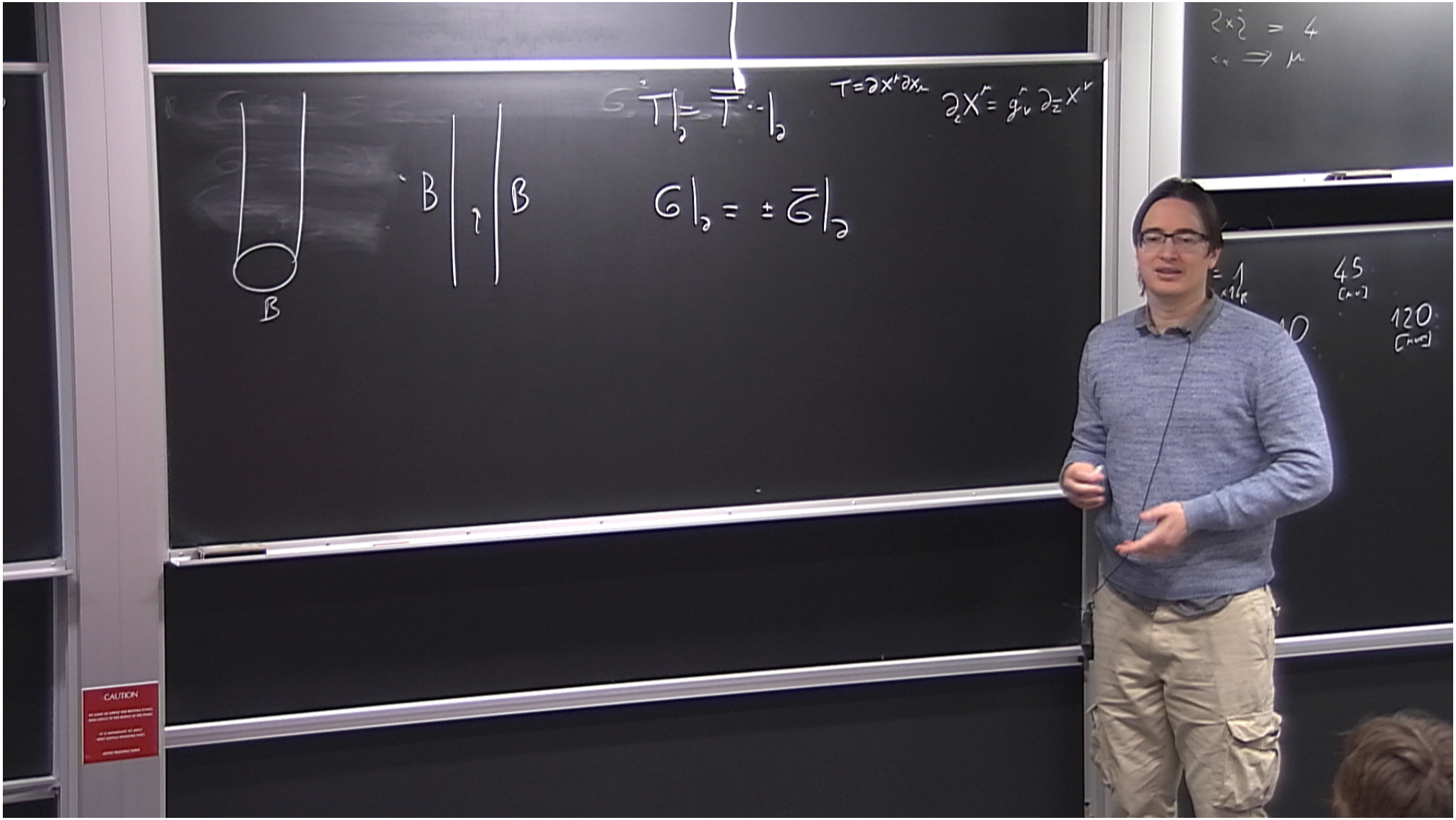

NSR
NSNS
RNS
RR
RR
NSNS
$\int A$
$F^{(2)} = dA^{(1)}$
$\int A^{(2)}$
$\partial \cdot = 0$
$R = G_{(S)}$
$G =$
$G_0 =$

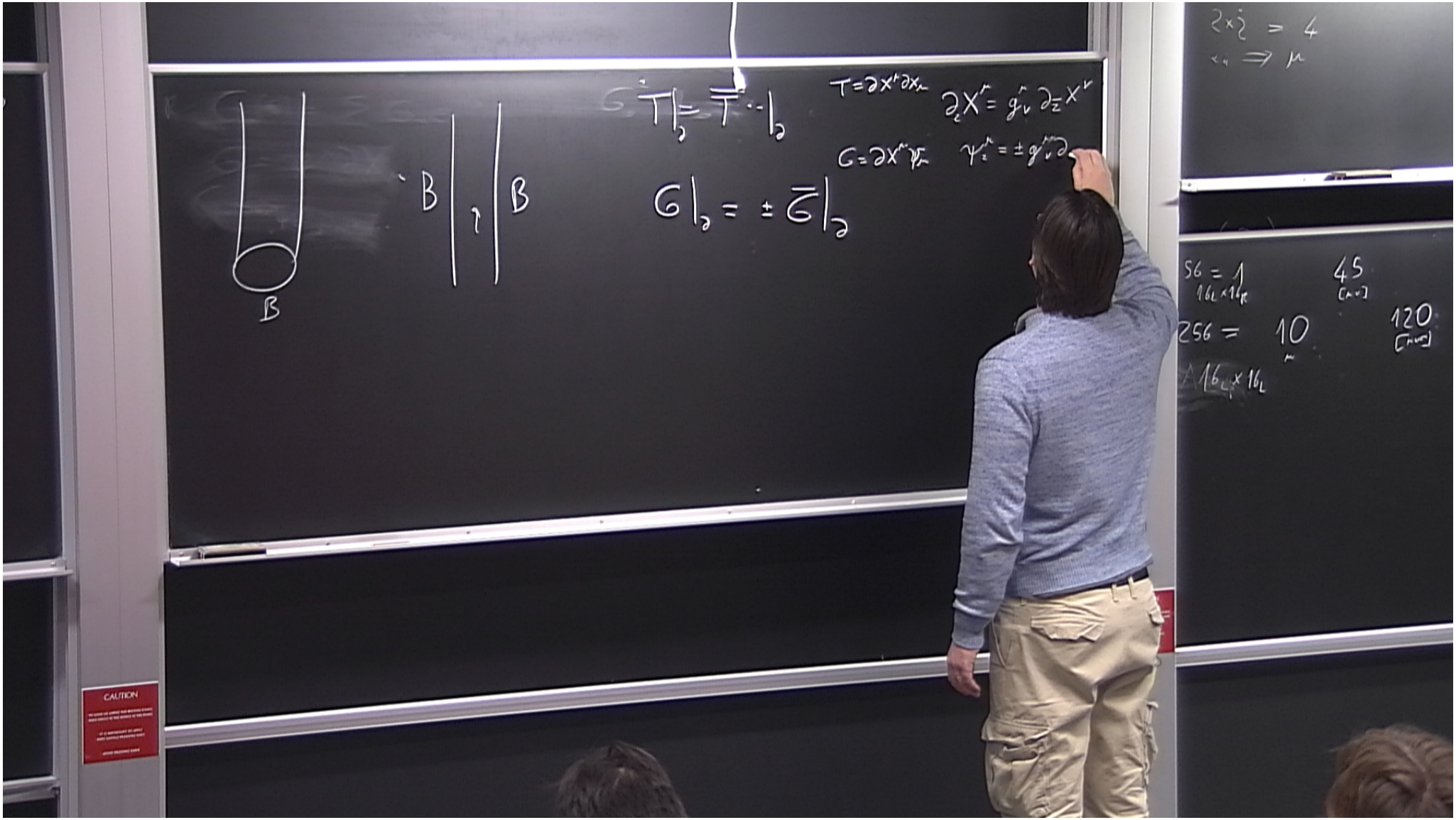

NS R
R NS
R R
IIB
OR
OR
IIA

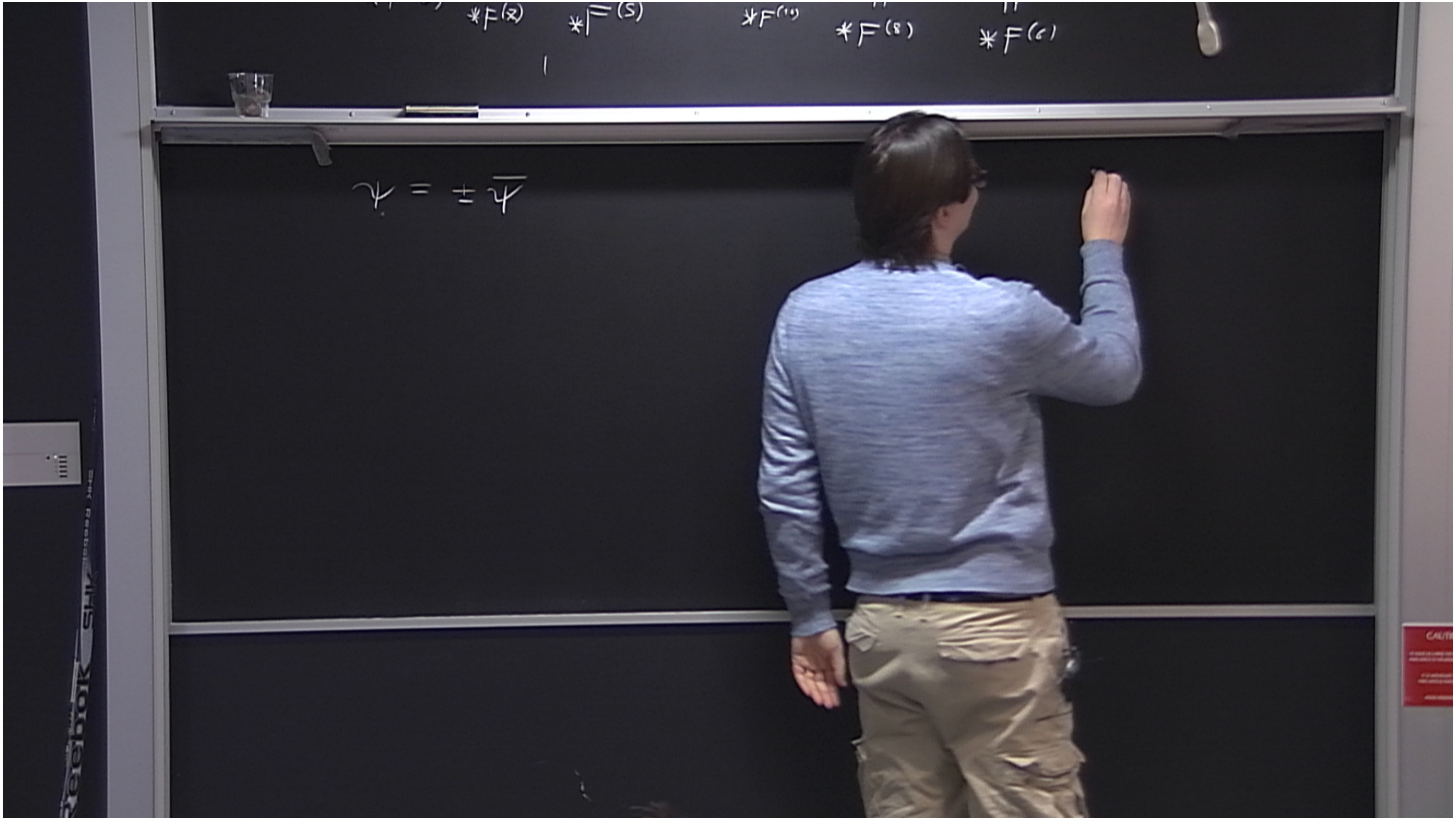

B
B
B
II A
256 = 10
CAUTION
CAUTION

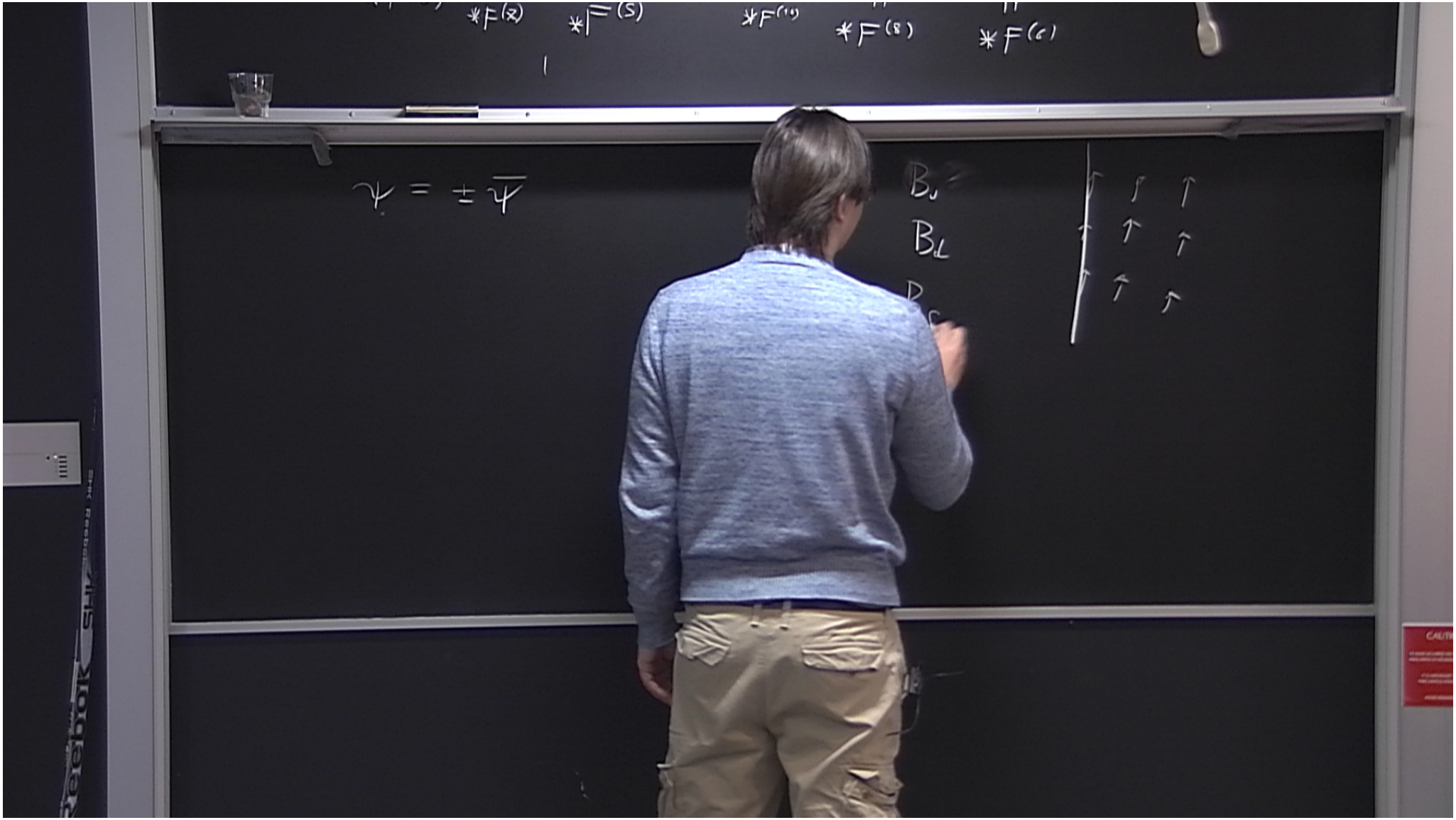

B
B
B
CAUTION
CAUTION

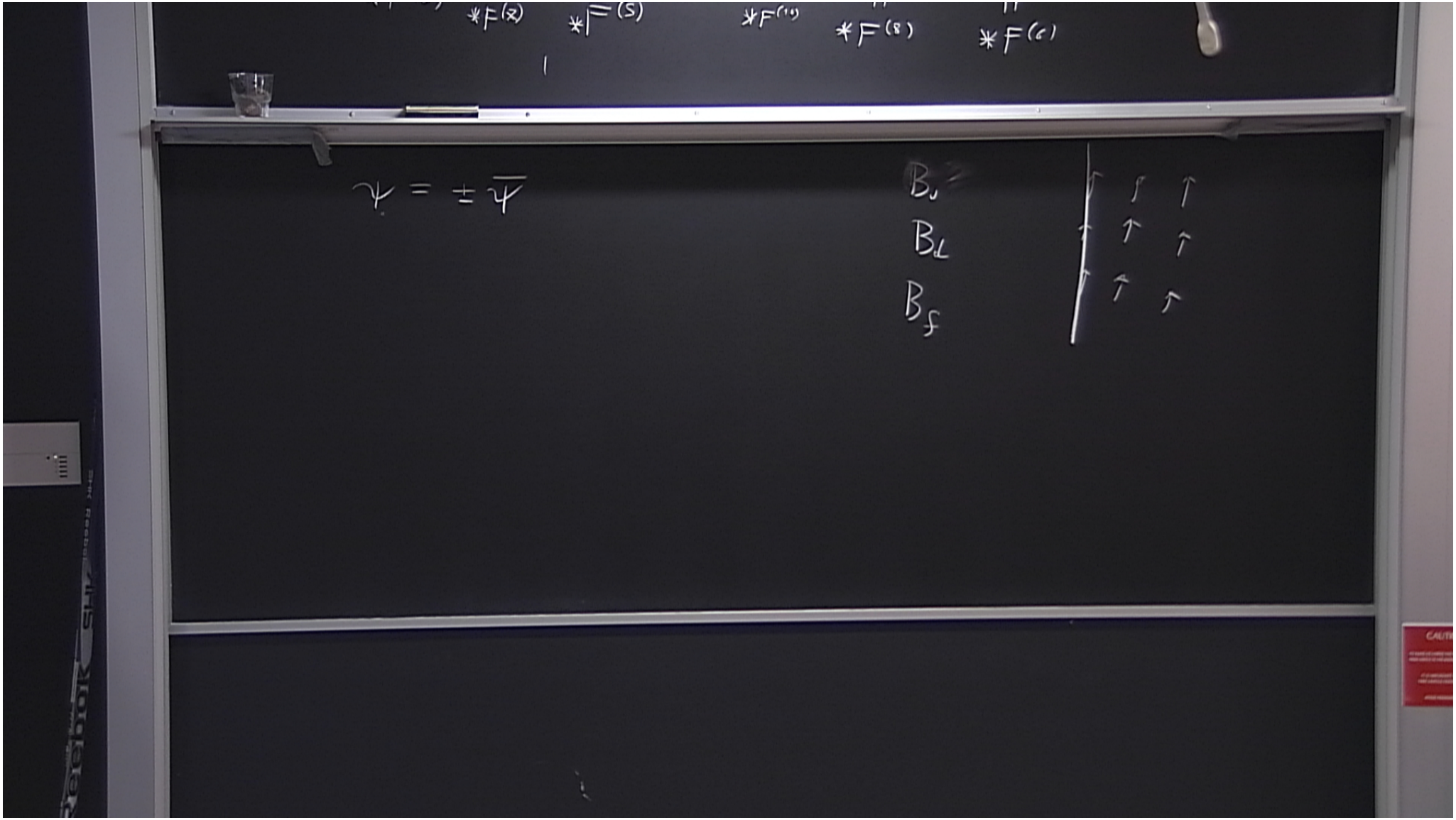

B
B
B
$T|_2 = \bar{T}|_2$
$\tau = \partial x^\mu \partial x_\mu$
$\partial_z X^\mu = g^{\mu\nu} \partial_{\bar{z}} X^\nu$
$G|_2 = \pm \bar{G}|_2$
CAUTION
CAUTION

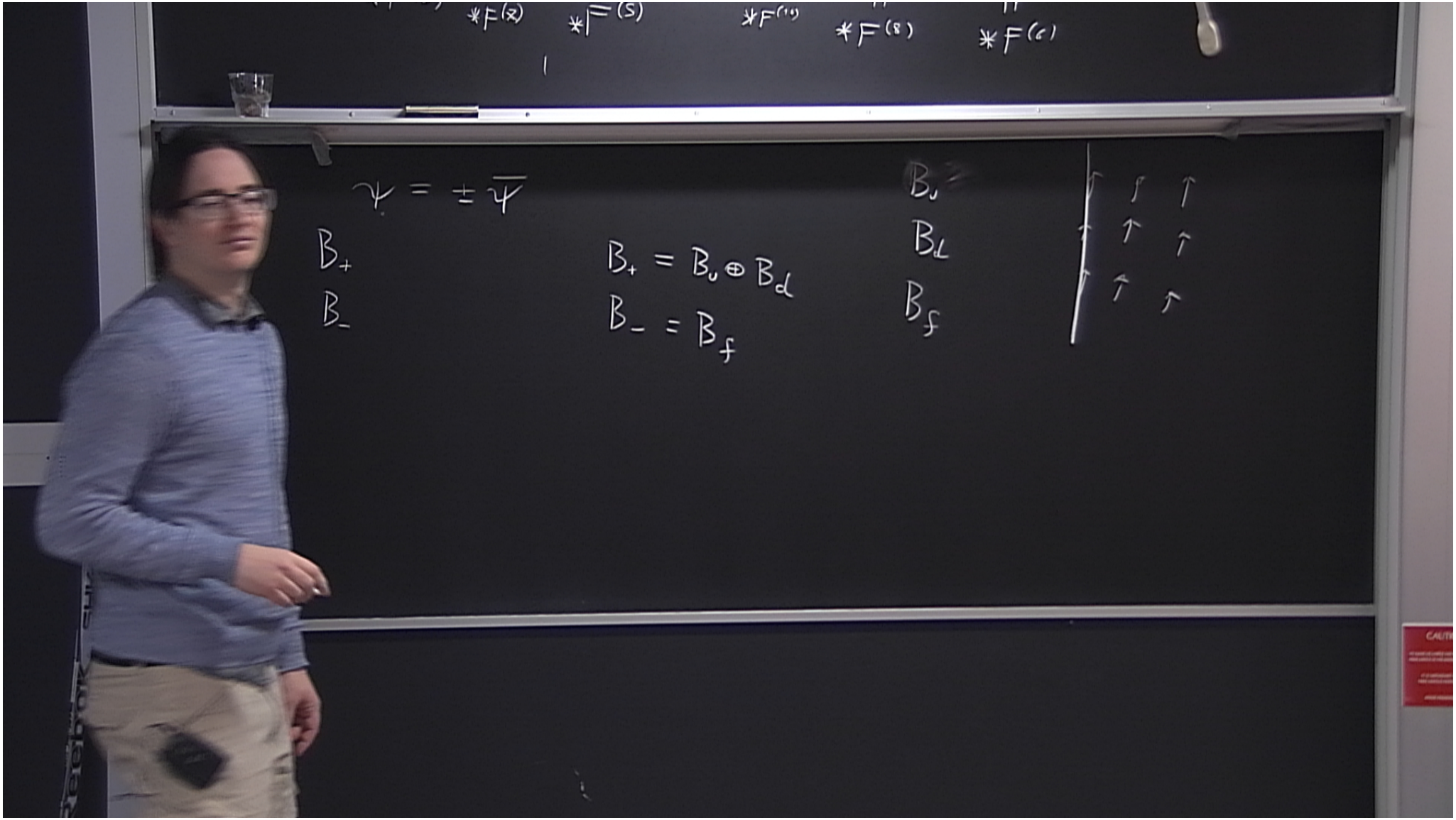

B
B
B
$T|_\partial = \bar{T}|_\partial$
$T = \partial X^\mu \partial X_\mu$
$\partial_z X^\mu = g^{\mu\nu} \partial_{\bar{z}} X^\nu$
$G|_\partial = \pm \bar{G}|_\partial$
45
120

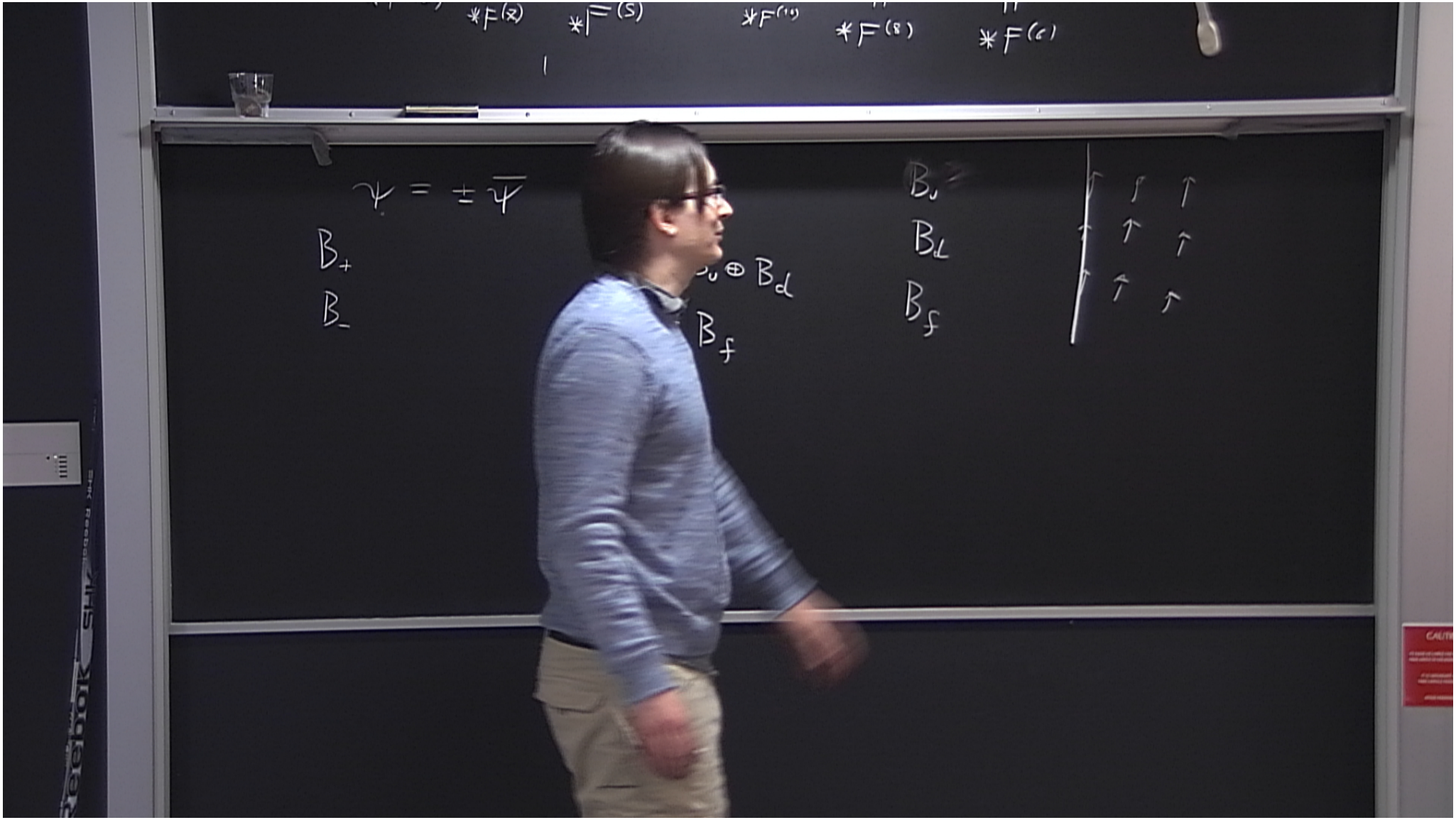

B
B
B
$T|_\partial = \bar{T}|_\partial$
$G|_\partial = \pm \bar{G}|_\partial$
$T = \partial X^\mu \partial X_\mu$
$G = \partial X^\mu \psi_\mu$
$\partial_z X^\mu = g^{\mu\nu} \partial_{\bar{z}} X^\nu$
$\psi_z^\mu = \pm g^{\mu\nu} \partial$
$2 \times 2 = 4$
μ
$SG = 1$
$16_L \times 16_R$
45
$256 = 10$
120
$16_L \times 16_L$
CAUTION

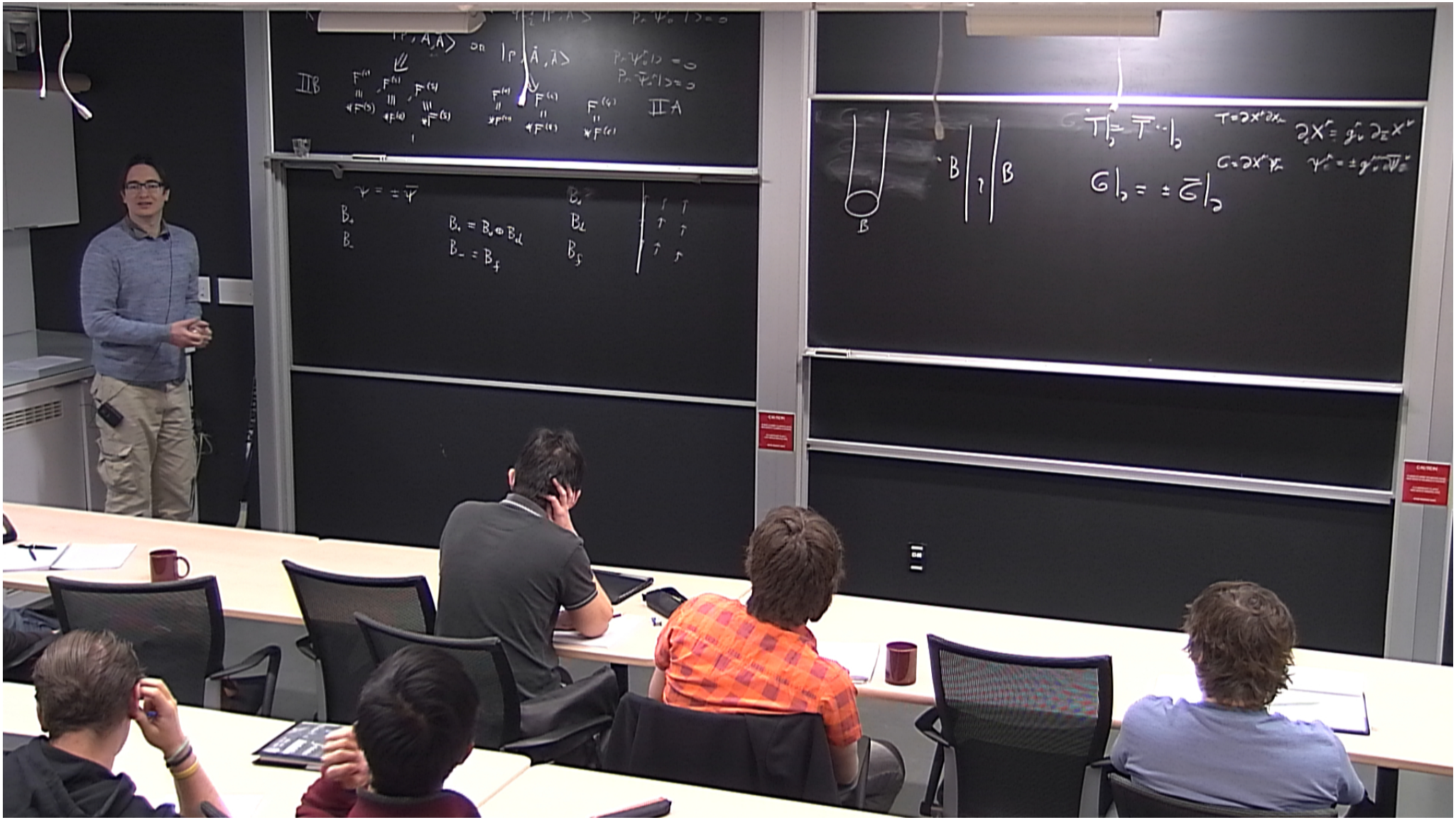

$*F^{(2)}$
$*F^{(5)}$
$*F^{(10)}$
$*F^{(8)}$
$*F^{(6)}$
$\psi = \pm \overline{\psi}$

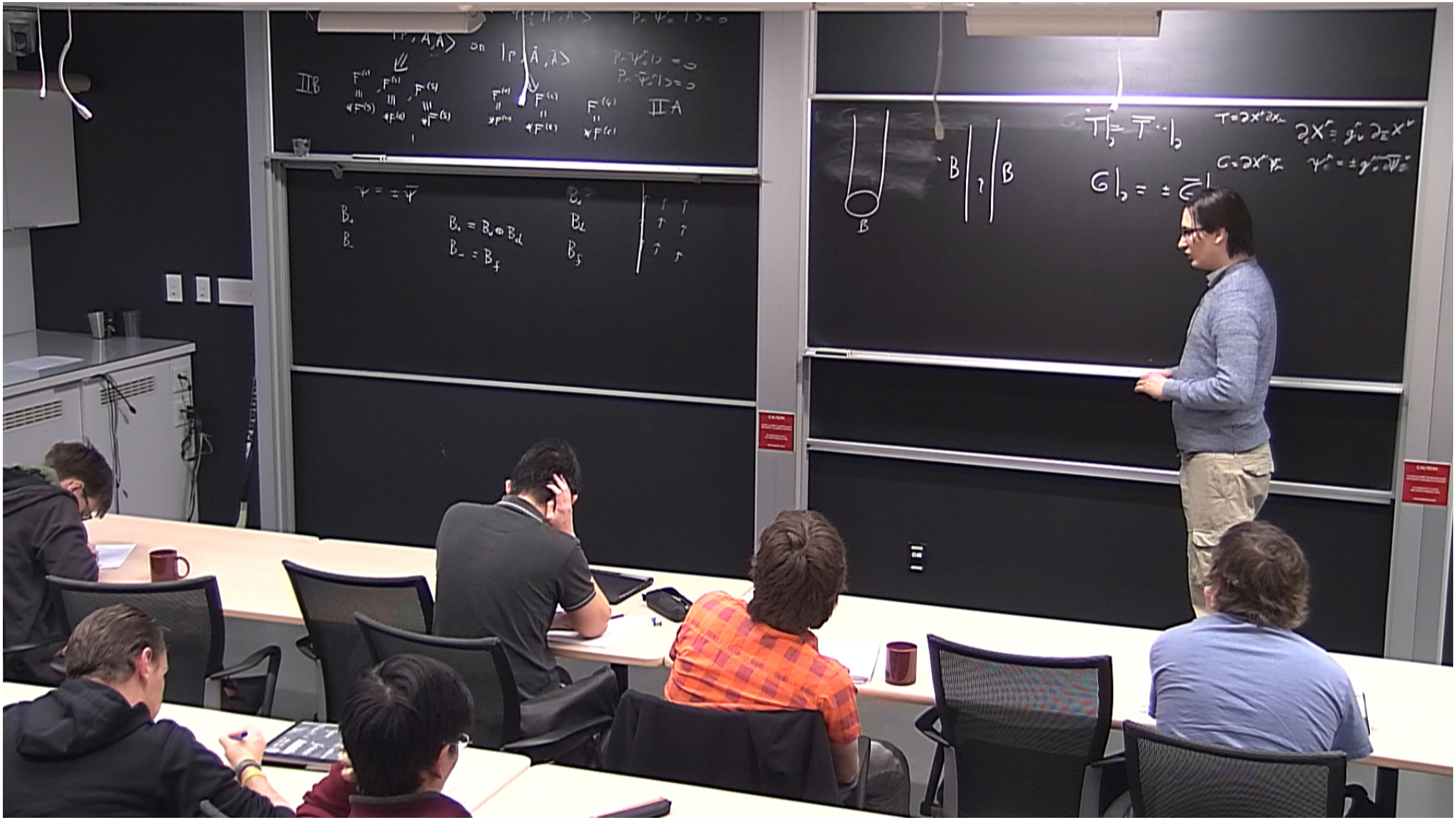

$*F^{(2)}$
$*F^{(5)}$
$*F^{(10)}$
$*F^{(8)}$
$*F^{(6)}$
$\psi = \pm\overline{\psi}$
B_J
B_L

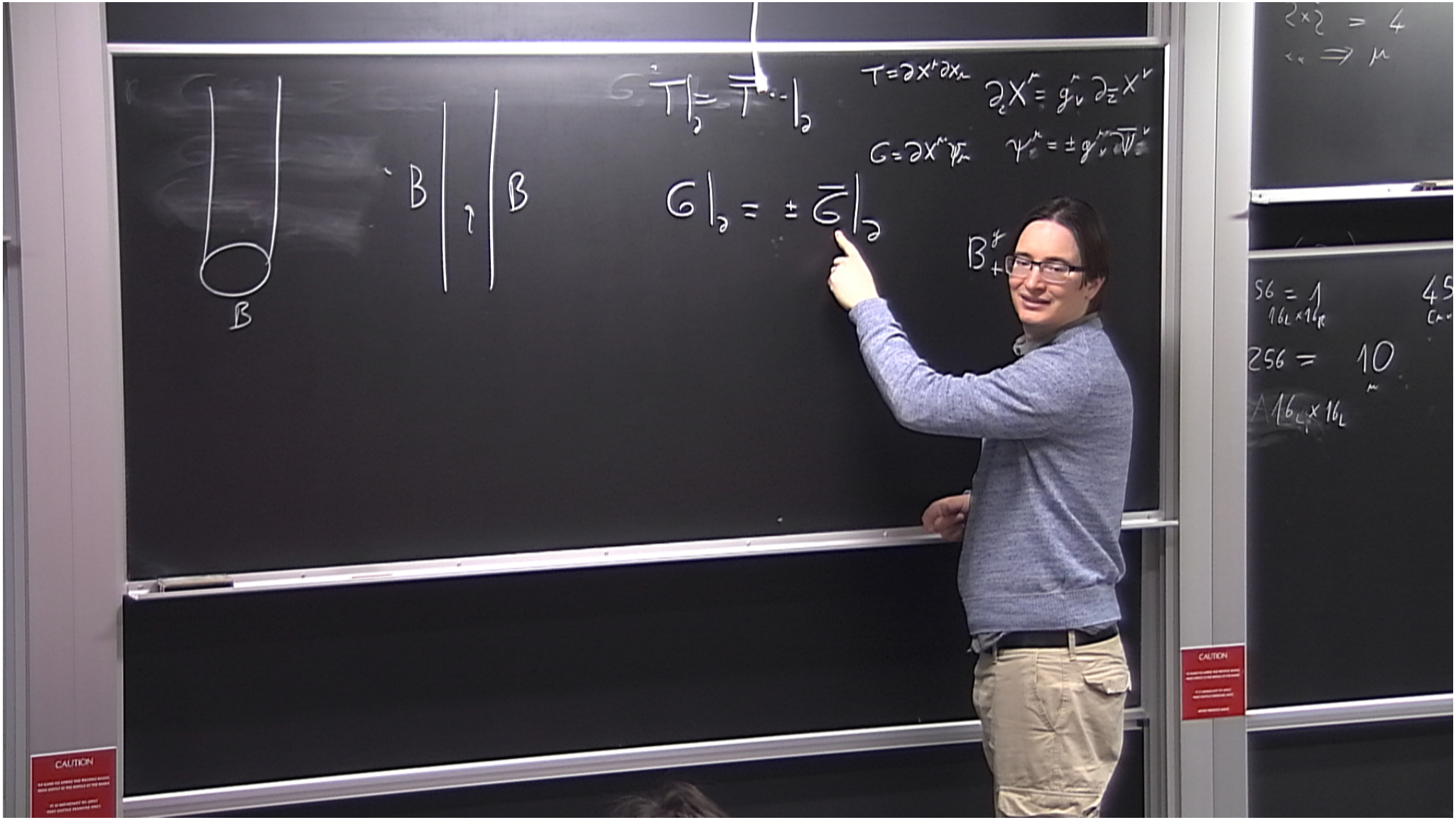

$*F^{(2)}$
$*F^{(5)}$
$*F^{(10)}$
$*F^{(8)}$
$*F^{(6)}$
$\psi = \pm \overline{\psi}$
B_J
B_L
B_S

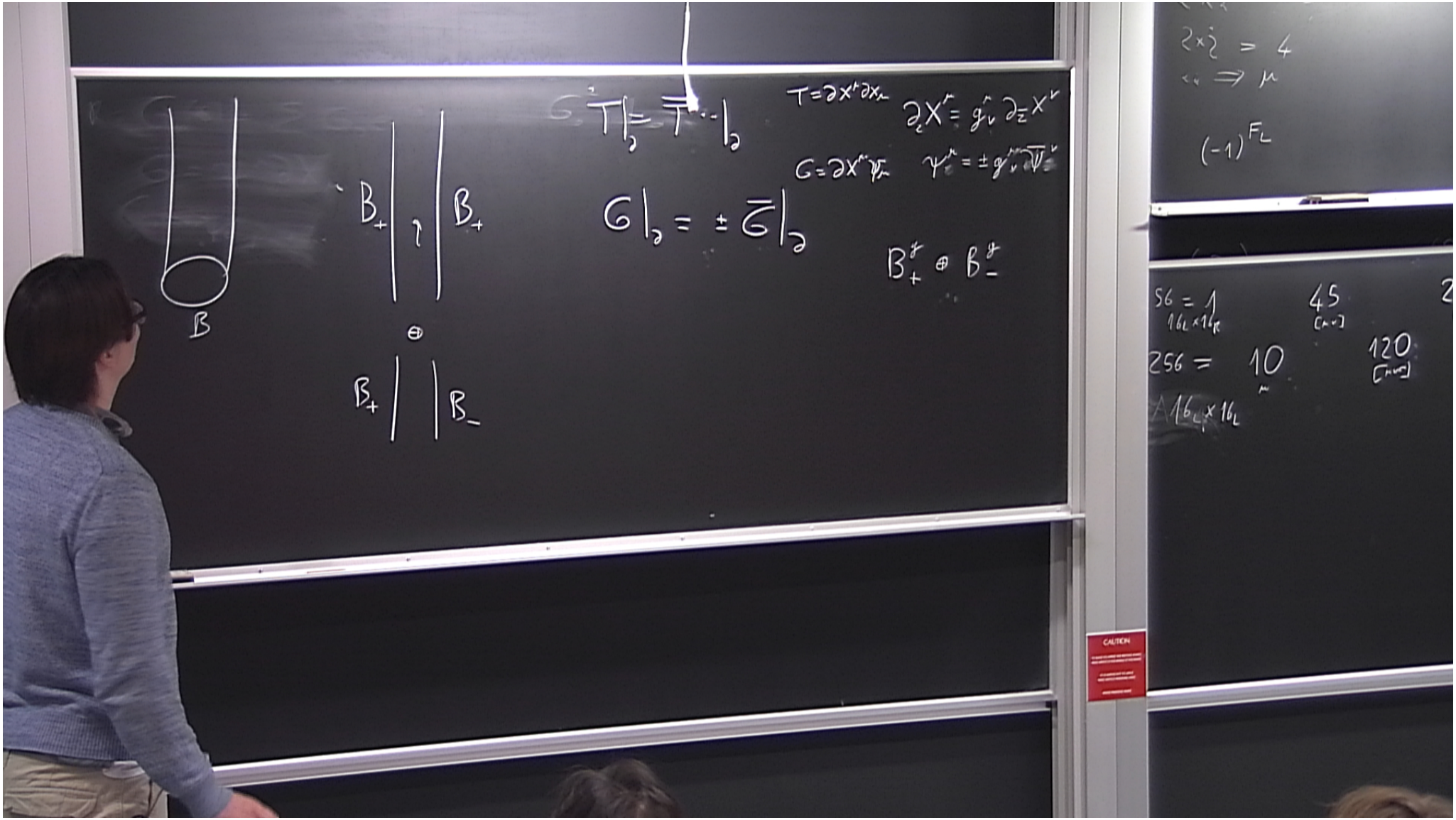

$*F^{(2)}$
$*F^{(5)}$
$*F^{(10)}$
$*F^{(8)}$
$*F^{(6)}$
$\psi = \pm\bar{\psi}$
B_+
B_-
$B_+ = B_v \oplus B_d$
$B_- = B_f$
B_v
B_L
B_f

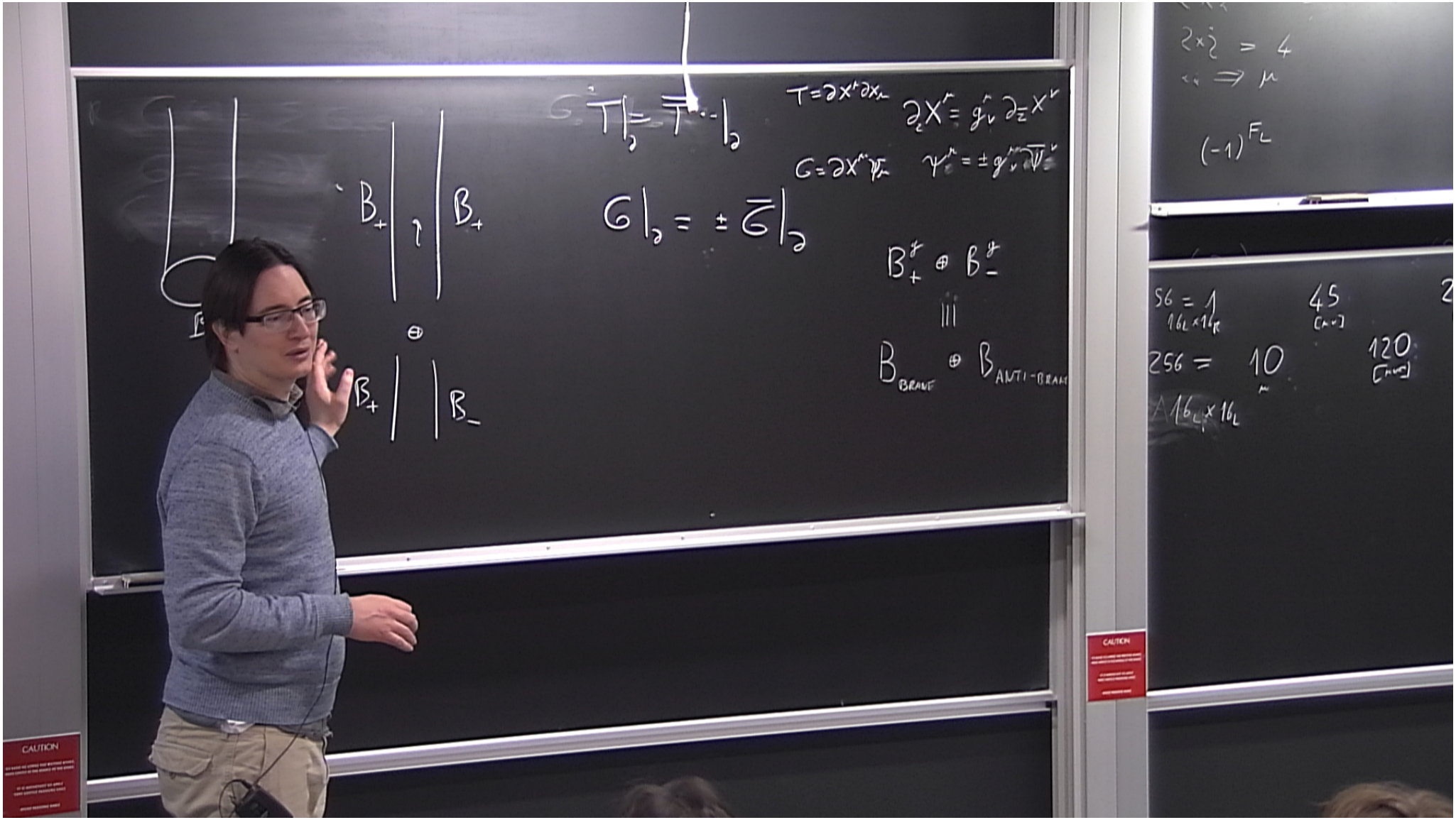

$\psi = \pm \overline{\psi}$
B_+
B_-
B_f
B_L
B_f

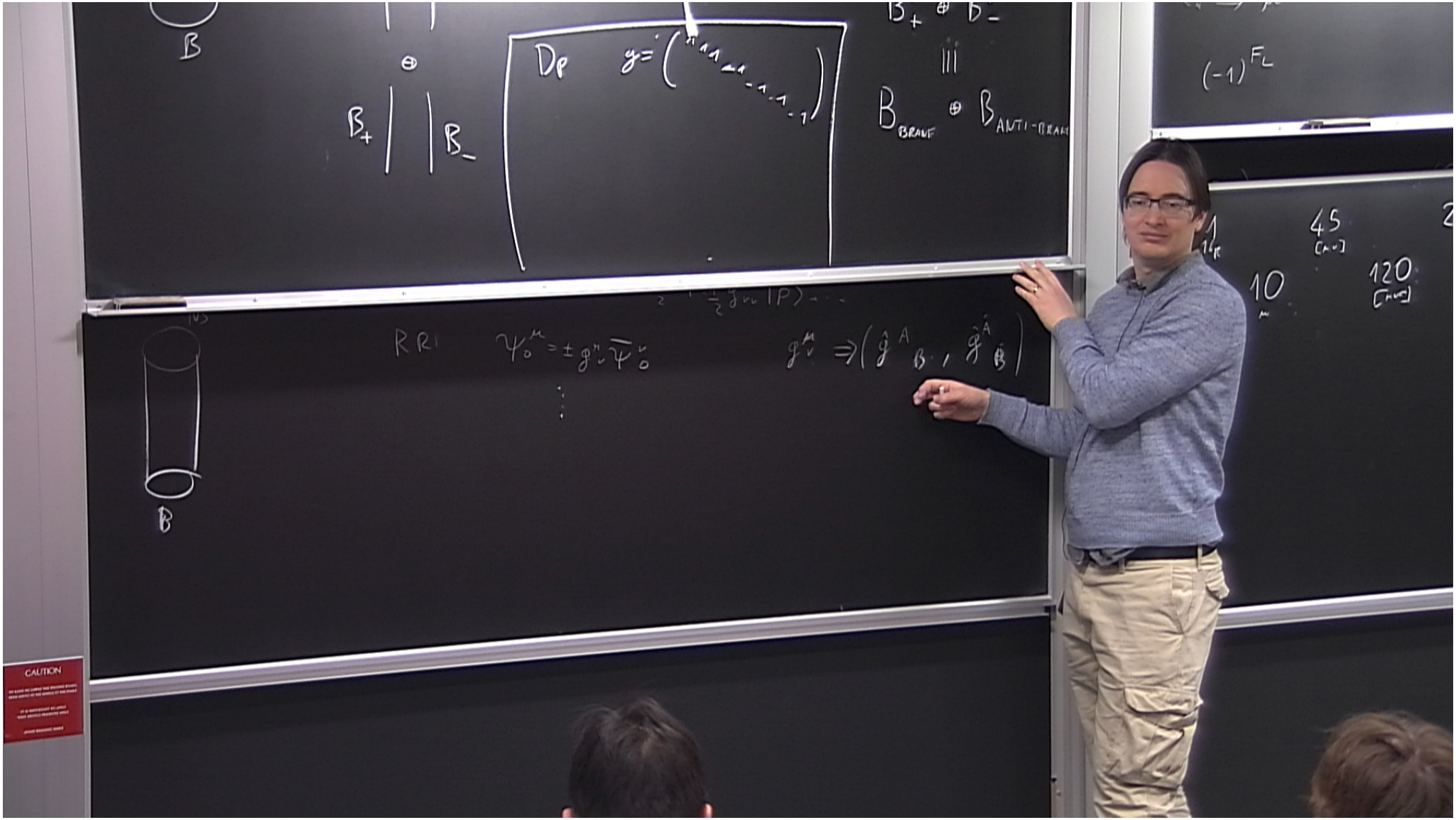


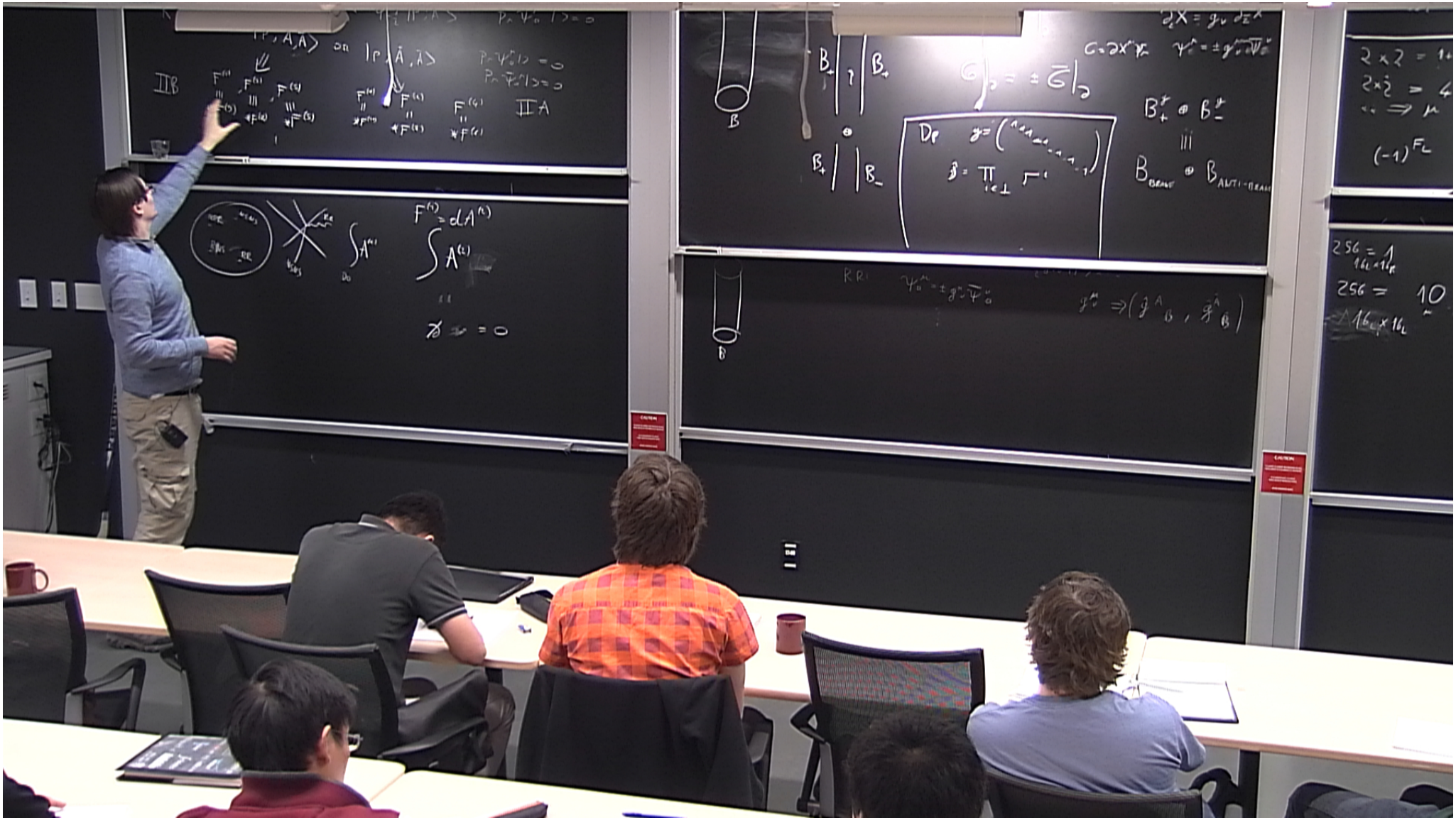


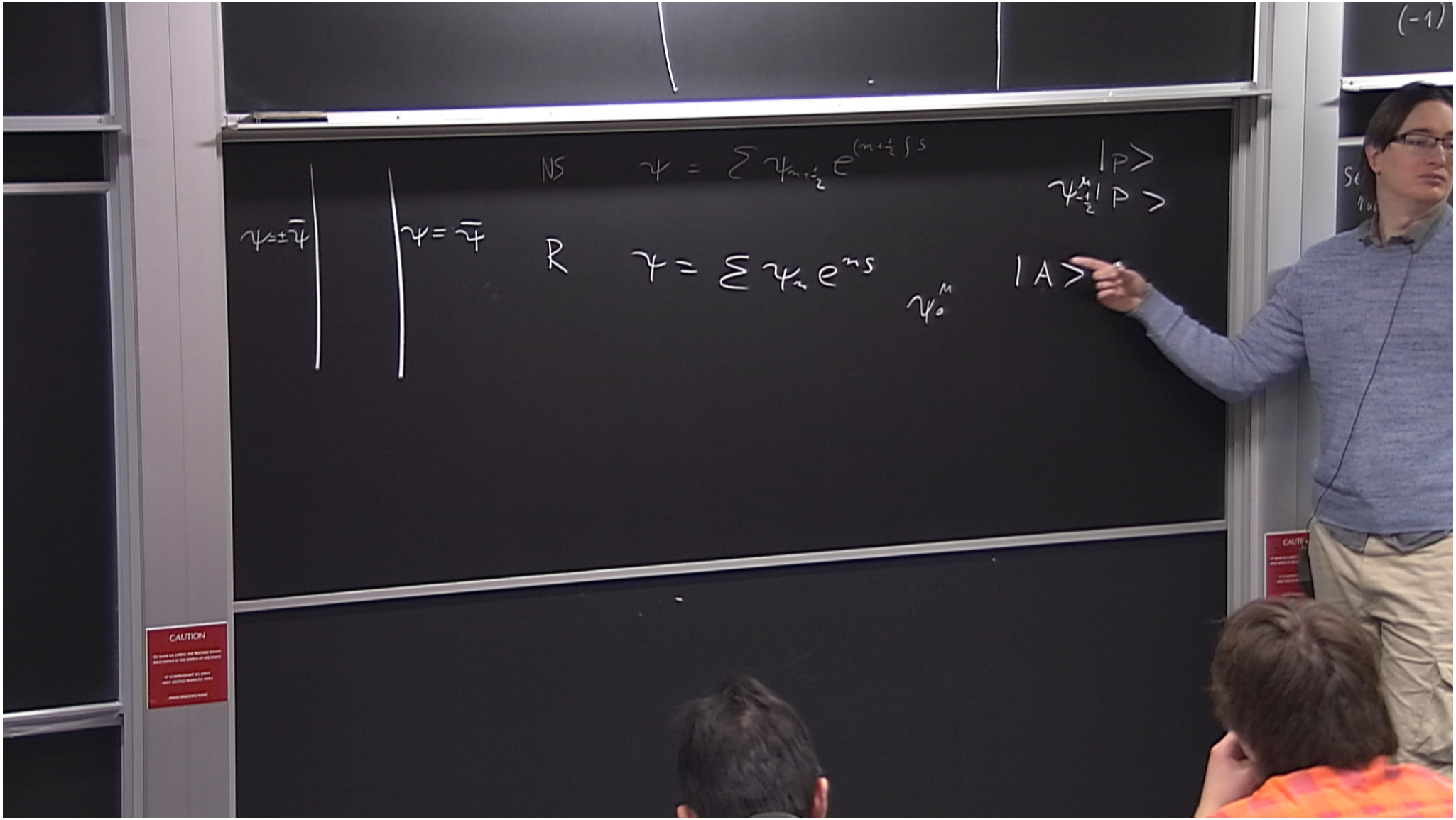

B
B
B
T = ∂X^μ ∂X_μ
∂_z X^μ = g^μν ∂_z̄ X^ν
G = ∂X^μ ψ_μ
ψ^μ = ± g^μν ψ̄^ν
G|_∂ = ± Ḡ|_∂
B^μ
SG = 1
16_L × 16_R
256 = 10
16_L × 16_L
CAUTION
CAUTION

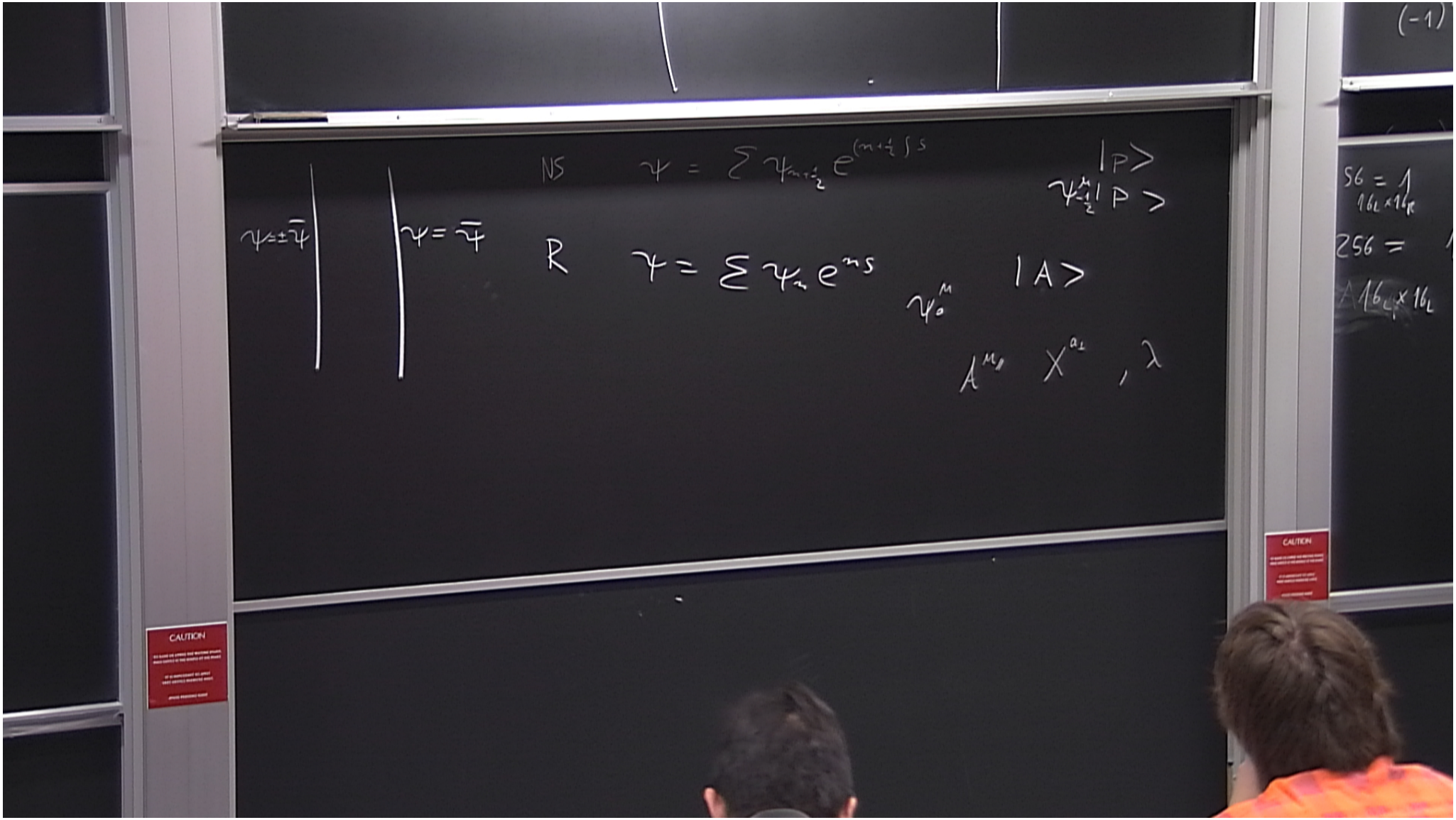

B
B+
B+
B+
B−
T|∂ = T̄|∂
G|∂ = ± Ḡ|∂
T = ∂X^μ ∂X_μ
G = ∂X^μ ψ_μ
∂_z X^μ = g^μν ∂_z̄ X^ν
ψ^μ = ± g^μν ψ̄^ν
B+^F ⊕ B−^F
2×2 = 4
(−1)^F_L
SG = 1
16_L × 16_R
45
256 = 10
120
16_L × 16_L

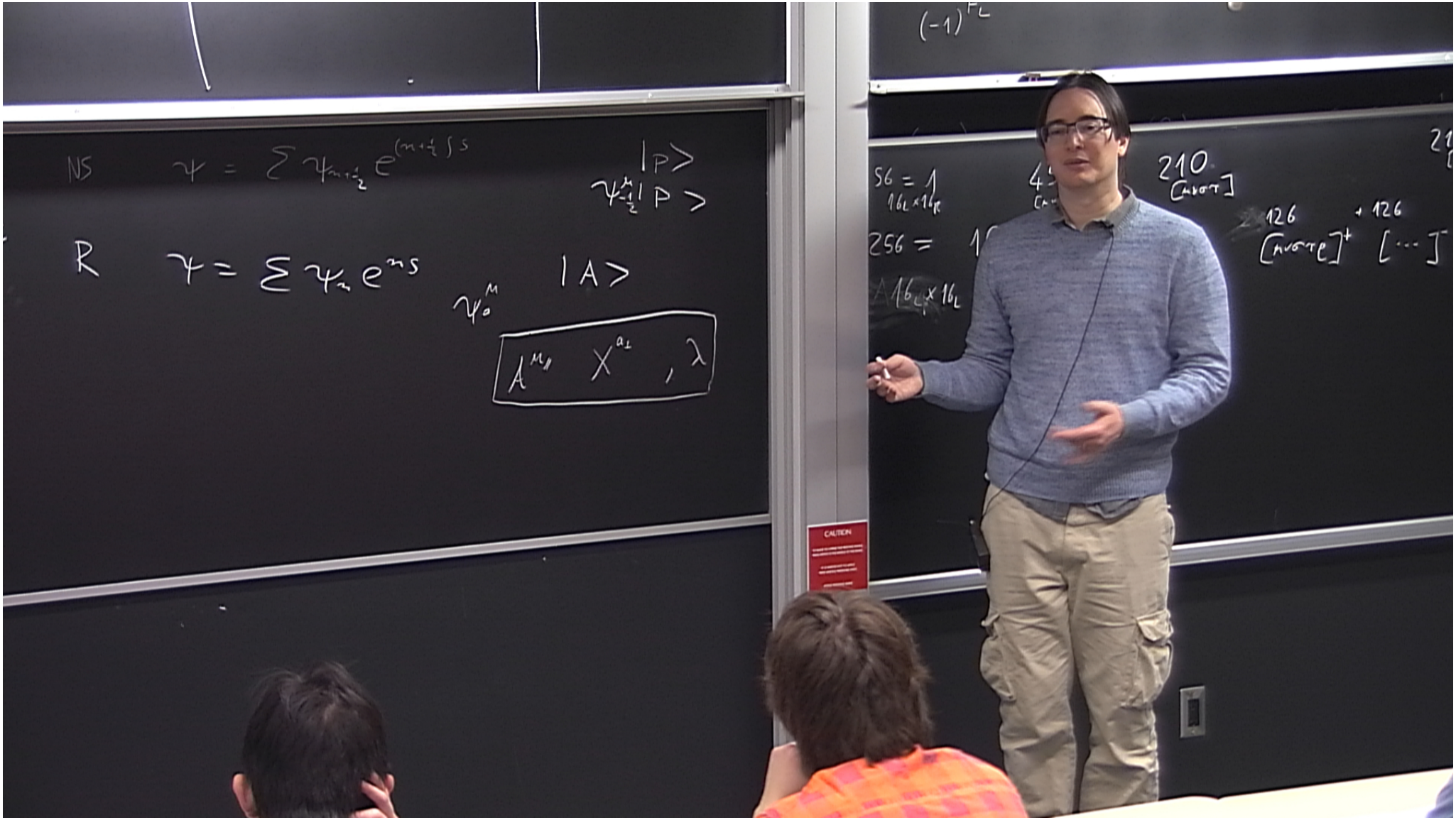

$T = \partial X^+ \partial X_-$
$\partial_z X^\mu = g^\mu_\nu \partial_z X^\nu$
$G = \partial X^\mu \psi_\mu$
$\psi^\mu = \pm g^\mu_\nu \bar{\psi}^\nu$
$G|_\partial = \pm \bar{G}|_\partial$
$B_+^\mu \oplus B_-^\mu$
$B_{BRANE} \oplus B_{ANTI-BRANE}$
B_+
B_+
B_+
B_-
$2 \times 2 = 4$
$\Rightarrow \mu$
$(-1)^{F_L}$
$56 = 1$
$16_L \times 16_R$
45
$256 = 10$
120
$16_L \times 16_L$
CAUTION
CAUTION

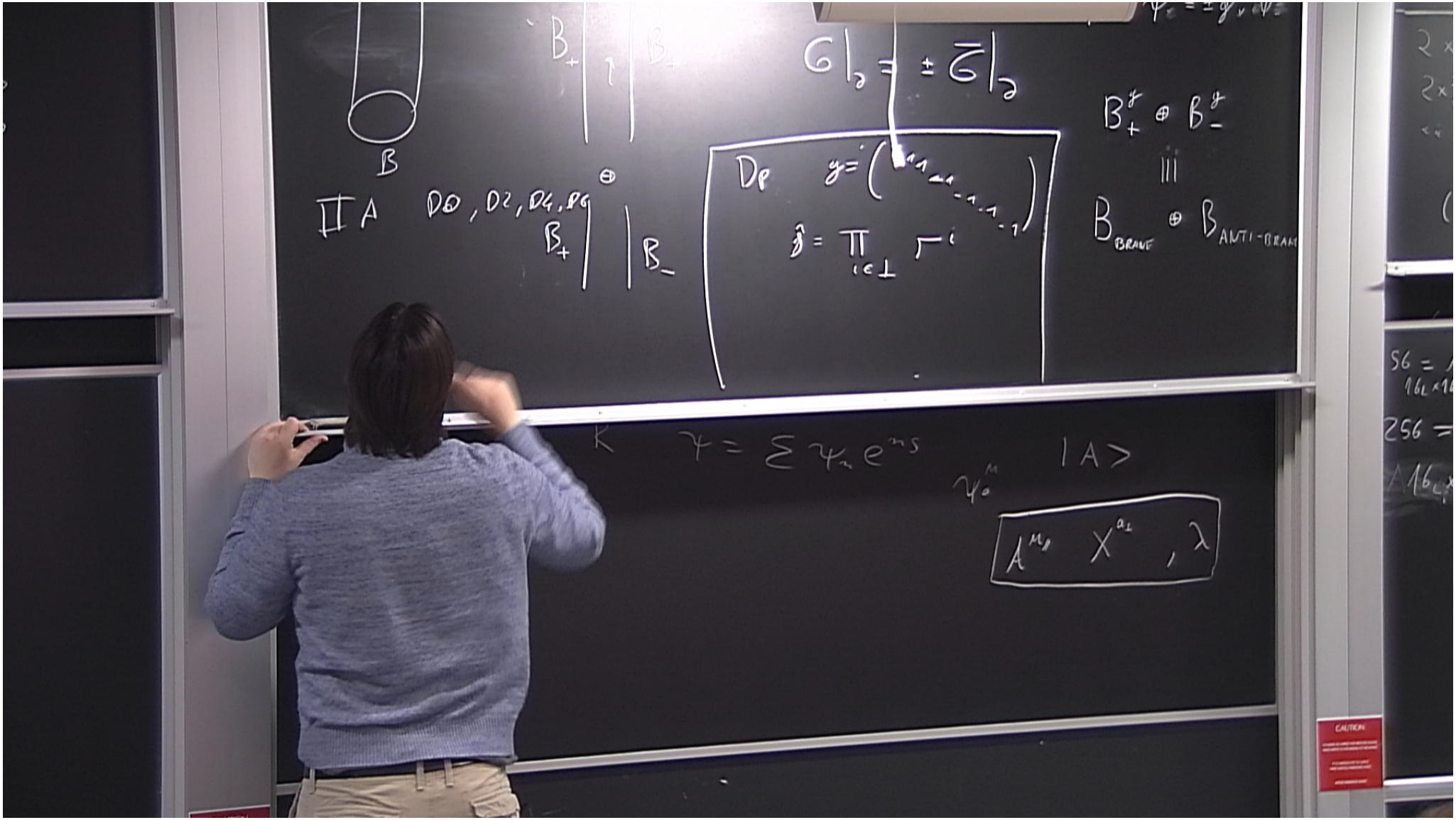

B
Dp
RR
CAUTION

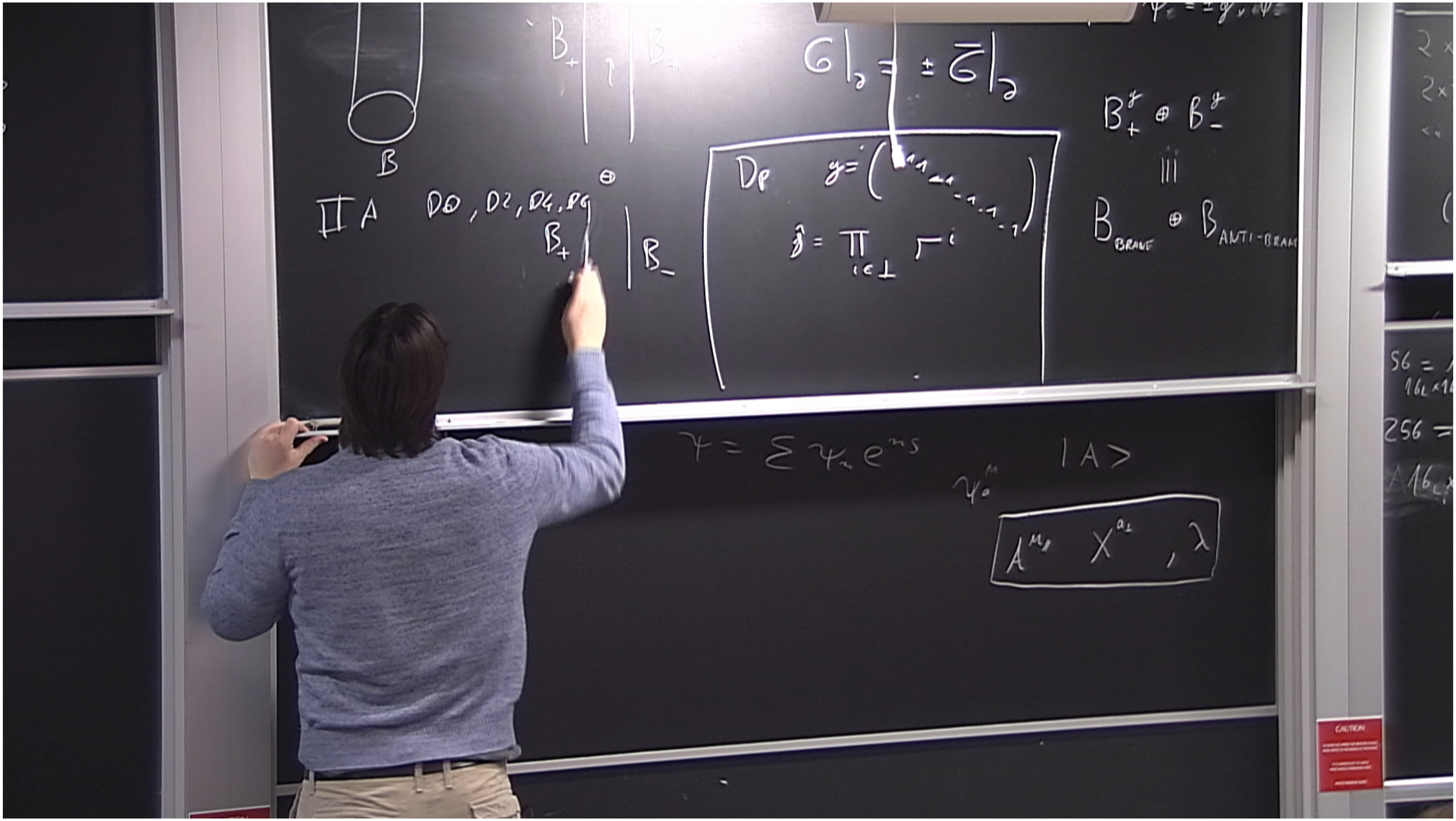


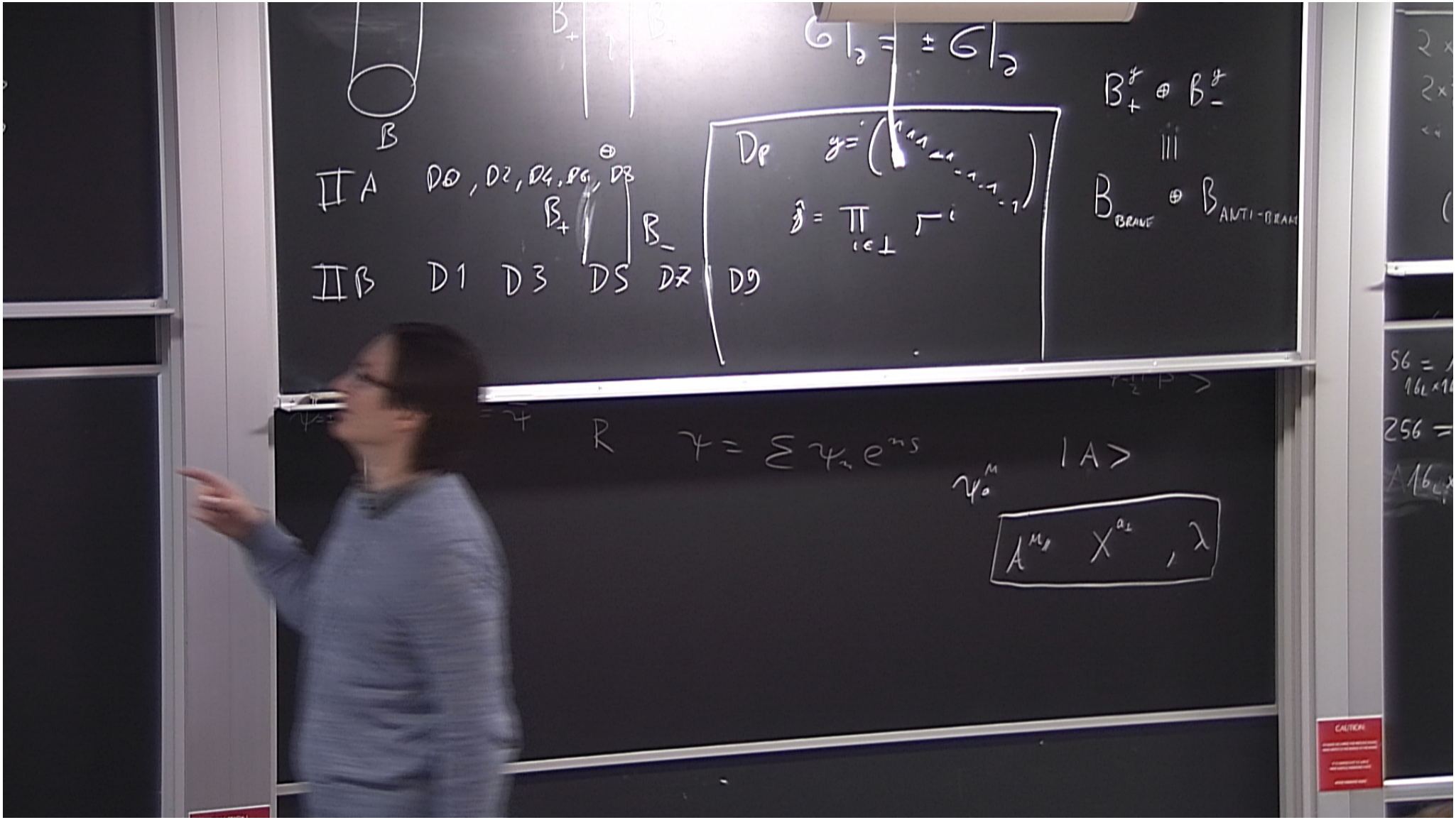

NS
$\psi = \sum \psi_{m+\frac{1}{2}} e^{(m+\frac{1}{2})s}$
$|p\rangle$
$\psi_{-\frac{1}{2}}^{\mu}|p\rangle$
$\psi = \pm\bar{\psi}$
$\psi = \bar{\psi}$
R
$\psi = \sum \psi_n e^{ns}$
ψ_0^{μ}
$|A\rangle$
(-1)
CAUTION


NS
$\psi = \sum \psi_{m+\frac{1}{2}} e^{(m+\frac{1}{2})s}$
$|p>$
$\psi_{-\frac{1}{2}}^{\mu}|p>$
$\psi = \pm\bar{\psi}$
$\psi = \bar{\psi}$
R
$\psi = \sum \psi_n e^{ns}$
ψ_0^{μ}
$|A>$
$A^{\mu}, X^{a_L}, \lambda$
$SO = \frac{1}{16_L \times 16_R}$
$256 =$
$16_L \times 16_L$
(-1)
CAUTION
CAUTION


NS
|P>
R
|A>
210
126
+ 126
CAUTION


B
B_+
B_-
$\sigma|_\partial = \pm\bar{\sigma}|_\partial$
$B_+^{\mathcal{H}} \oplus B_-^{\mathcal{H}}$
$\cong$
$B_{BRANE} \oplus B_{ANTI-BRANE}$
$\prod A$ D0, D2, D4, D6
B_+
B_-
D_p
$\hat{g} = \prod_{i \in \perp} \Gamma^i$
$\gamma = \sum \gamma_n e^{ns}$
$|A\rangle$
γ_0^M
$A^{M_\parallel}$ $X^{a_\perp}$, λ


B
IIA D0, D2, D4, D6
B+ | B-
Dp
B_BRANE ⊕ B_ANTI-BRANE
|A>


B
B+
B-
G|∂ = ± G|∂
B+γ ⊕ B-γ
III
B BRANE ⊕ B ANTI-BRANE
IIA D0, D2, D4, D6, D8
B+
B-
IIB D1 D3 D5 D7 D9
Dp
R
|A>
A^μ X^a⊥ , λ